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ABSTRACT

To determine the current and future competencies required by librarians and information professionals, a project was undertaken to meet the following objectives: set forth an idealized framework to be used by the librarian and information professional community; determine a first set of competencies which are validated in the workplace to some extent; establish initial education and training requirements; initiate a process for communication among the principal librarians and information professional participants which can be continued after project completion; and describe steps that can be taken in the future to ensure continuation of the competency achievement cycle. To meet these objectives, substantial input was obtained from a large number of organizations, educators, employers, professional societies, and individual professionals. The study results are presented in a six-chapter report and five appendices. Report chapters comprise: Overview of the Project; A Framework for Describing Librarian and Information Professional Competencies; Methods; Information Workers and Librarians and Information Professionals; Librarian and Information Professional Competencies; and Educational Requirements and Implications. Appendices include a literature review; secondary analyses (including analyses of information professional and librarian vacancy announcements); an example of the relationships between competencies, performance, effectiveness, and value in three special libraries; a bibliography; and an annotated bibliography. Twelve supplementary volumes provide detailed descriptions of competencies for the following positions: (1) Academic Librarian; (2) Public Librarian; (3) School Librarian; (4) Special Librarian; (5) Database Producer; (6) Database Distributor/Service; (7) Information Center/Clearinghouse; (8) Records and Information Manager; (9) Archivist/Museum; (10) Information Analysis Center; (11) Information Service Company; and (12) Library System Supplier. (THC)

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NEW DIRECTIONS IN LIBRARY AND INFORMATION SCIENCE EDUCATION

FINAL REPORT

July 1985

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NEW DIRECTIONS IN LIBRARY AND INFORMATION SCIENCE EDUCATION

FINAL REPORT

July 1985

by:

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Donald W. King

Submitted to:

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CHAPTER 1

OVERVIEW OF THE PROJECT

PROJECT OBJECTIVES

The stated objectives of this project were twofold:

- the listing, description, and validation of the competencies required at several professional levels and within several areas of professional specialization in the library and information science field; and
- the discussion and examination of present and future education requirements necessary to achieve the discrete levels of competencies by professional level and speciality.

Our approach to the project was to determine the current and future competencies required by librarians and information professionals for exemplary performance. Central to our approach was the theme of communication among all participants in the educational process: educators, employers, professional societies and individual professionals. An essential feature of this approach is the evolution of a process which will yield a set of competencies and the continuation of that process which will provide updated and refined sets of competencies. We feel that this process can be further developed to enhance timely feedback among the participants in the information community to ensure that current competencies are identified, described, validated, and taught in a timely fashion.

There are three principal outputs of the New Directions in Library and Information Science Education project. The first of these outputs is a detailed description of the information environment within which librarians and information professionals work. In order to describe librarian and information professional competencies, it was necessary to identify their work settings, functions in which they are engaged, services they provide, and activities they perform. The second and principal output is a listing of librarian and information professional competencies, accompanied by corresponding work activities. A final output has been the initiation of extensive communication among participants in the educational process.

This has been accomplished through direct involvement of the project staff, the Advisory Group, and voluntary contributions from hundreds of librarians and information professionals. We have also given numerous speeches and seminars, participated on committees and task forces relevant to librarian and information professional education, written serveral articles and distributed hundreds of newsletters to members of the information community. There is little doubt that a meaningful dialog has begun.

A FRAMEWORK FOR DESCRIBING THE INFORMATION ENVIRONMENT

In order to analyze, interpret and use the competency descriptions, we have formed a framework which serves to categorize the competencies and which demonstrates the economic importance of the competencies of librarians and information professionals. The information environment, of which competencies form an integral part, consists of (1) information work settings within which generic information transfer functions are performed, (2) work functions performed in the work settings, (3) information services and products related to the work functions, (4) activities performed to provide the services and products, (5) resource components needed to support the activities, and (6) essential characteristics of the resource components. Probably the most important resource component is staff and the most essential characteristics of people are their competencies. The reason for this is that information service performance (e.g., measured in terms of quantities produced, quality and timeliness, etc.) is highly dependent on the competencies of librarians and information professionals. Their performance in turn affects the effectiveness of a service in terms of user satisfaction, repeated use and total amount of use. Amount of information use is directly related to the value of information (hence, to the value added by the information services and products) and yields higher order effects such as an informed public, improved institutions and better education.

Later in this report, we present some examples of how the framework is applied, focusing on special libraries (as a work setting), reference (as a function), reference searching (as a service), conducting of searches (as an activity), the professional librarian (as a resource component) and competencies (as a characteristic of the resource component). We also attempt to illustrate that competencies are acquired through education, training, and experience, and that increased competencies yield higher work performance and greater effectiveness. Finally, since competencies and performance are both demonstrated through the detailed activities performed, we have given examples of activities relating to the reference function and the corresponding competencies necessary to accomplish the activities, and, in turn, to achieve exemplary performance (sample measures of which are also presented).

The detailed, hierarchical descriptions of work settings, functions, etc. down to characteristics of components evolved from approximately fifty major studies performed by KRI over the years. These studies generated results in cost and performance, effectiveness and value models used for evaluation, network analyses, government OMB Circular A-76 reviews, and so on. The inclusion of competencies as characteristics of the labor component of activities is a natural extension of these economic models.

Examples are given in later in this report that demonstrate the linkages between competencies (e.g., subject knowledge, reference knowledge, skills and attitudes) and performance (e.g., quality of reference searching and timeliness). Performance is then related to effectiveness (e.g., user satisfaction and number of uses). Finally, effectiveness (number of uses) is related to the value of information and of the reference services which provide access to the information. Thus, an initial approach to relating competencies, performance, effectiveness and value is established.

Extensive data were also gathered as part of this New Directions project to help describe the changing environment within which librarians and information professionals find themselves in the Information Age. This information gathering included a study of the disciplines of information, information-related research, investigation of the implications of the Information Age for librarians and information professionals, new technologies, economics of the information environment, information policies and so on. Special analyses were performed on data collected by UCLA concerning schools of library and information science. Furthermore, data were collected and analyzed on job descriptions obtained from employers, the federal government, and advertisements for job openings in newspapers and professional journals. Finally, special analyses were conducted of studies performed by KRI with the University of Pittsburgh on the occupational survey of librarians and information professionals [Debons, et al., 1981] and the supply and demand for librarians [Roderer, et al., 1983].

PROCESSES FOR ACHIEVING LIBRARIAN AND INFORMATION PROFESSIONAL COMPETENCIES

An Idealized Process

We felt that the best approach to the project was to (1) envision an ideal process and environment for achieving needed competencies in a timely fashion, (2) establish objectives which could reasonably be accomplished by the project toward this idealized end, (3) accomplish these objectives, and (4) recommend what could be done toward reaching an ideal process. An ideal process for achieving competencies involves five phases: recognition of changing competency needs and requirements in the workplace, determining these changing competencies, establishing education and training requirements, designing and implementing curricula and courses, and demonstration of new competencies in the workplace. These steps are actually cyclical in nature (as shown in Figure 1) in that the demonstration of competencies in the workplace should in turn lead to a recognition of new competency requirements and so on. Since the process is cyclical it is difficult to say where to start reviewing it. However, the workplace seems to be an appropriate place since the ultimate indicator of the effectiveness of education and training is how well librarians and information professionals do their work.

Librarians and information professionals work in a particularly dynamic environment. Information creators and users are becoming much more information intensive. New technology offers opportunities for many new ways to record, reproduce, store, identify, access, and communicate information. Such changes require new ways for librarians and information professionals to process and handle information on behalf of others. Thus,

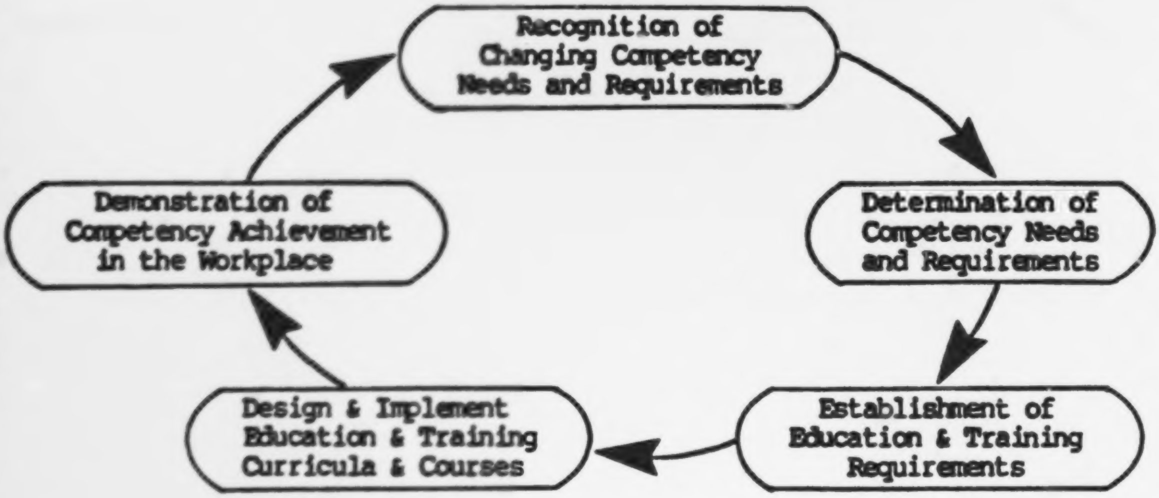
Recognition of Changing Competency Needs and Requirements
Determination of Competency Needs and Requirements
Establishment of Education & Training Requirements
Design & Implement Education & Training Curricula & Courses
Demonstration of Competency Achievement in the Workplace

Figure 1. Process for Achieving Librarian and Information Professional Competencies

needs and requirements for librarian and information professional competencies are constantly changing. This is a simple fact. If the information community is to respond to such a dynamic environment, it must first recognize the changes taking place and then be able to determine, on a continuing basis, the resulting competency needs and requirements, establish education and training requirements, and so on.

The next phase involves determination of all librarian and information professional competencies from a variety of work settings. This phase also involves a cyclical process of defining, identifying, describing and validating the competencies. Competencies can be defined in broad terms such as knowledge, skills and attitudes. Presumably, competencies of librarians and information professionals vary by work settings, activities performed, level of work done, etc. Thus, they would need to be identified and described for all such environments and conditions in which librarians and information professionals work. Validation, in an ideal situation, would involve at most measures of competencies that exhaustively explain (or contribute to) performance, even if these measures were zero or one, indicating the need or lack of need for a competency. At minimum the competencies could be validated by opinions concerning their appropriateness.

From the validated competencies one can establish education and training requirements by comparing the required competencies in the workplace against those being provided through education and training. Education and training requirements would incorporate new competencies which students need to acquire and exclude those that may no longer be necessary or appropriate. The educational requirements would indicate which validated competencies might be achieved through formal education (e.g., subject knowledge in undergraduate courses, and information organization and control knowledge in library graduate courses), through continuing education programs (e.g., knowledge of management methods and new technology), or through training on the job (e.g., knowledge of the specific workplace and community served, and skills associated with the use of specific reference tools). All of this, of course, assumes that we know which competencies are being taught and acquired in universities, continuing education programs and on the job.

Once education and training requirements resulting from competency needs are determined, the education and training communities can design and implement appropriate curricula and courses. Design and implementation would depend in part on the incoming students, their existing knowledge, skills and attitudes, and their capacities and willingness to learn. Presumably, these characteristics could be measured upon application to enter programs. In an ideal world, part of this step, also cyclical in nature, should be to evaluate curricula and measure the extent of competency attainment. Clearly, knowledge is measured through tests and course grading. However, there are many tests for knowledge, skills and attitudes that could measure the changes in competencies demonstrated before and after the educational process. In a sense, these measures of competency attainment are measures of education and training performance. The effectiveness of education and training, then would be the performance of graduates in their work and in other life-long activities. Ideally, again, an important component of formal education would be to teach one how to learn, to inquire, to evaluate, to reason, as well as to provide some basic knowledge and skills in the information disciplines.

In an ideal situation, employers would be able to determine their competency requirements; hire (or train) professionals to meet these requirements; evaluate competencies in terms of professional performance, effectiveness and value; and then determine new competency requirements. This cyclical process would constitute an ideal validation of competencies in the workplace. Assuming that required competencies can be identified and described, an employer could test prospective professional employees to determine whether or not they have the required competencies. If they do not have all of them, the employer could then decide whether the needed competencies could be attained through training and/or on-the-job experience. In the ideal environment, employees' competencies would be evaluated in terms of their performance, measured in terms of quantities produced, quality and timeliness, etc. The levels of satisfactory performance would be related to effectiveness, considered from the perspective of users. Such effectiveness measures would include user satisfaction, repeated use and amount of use of information services and products. Higher order effects, such as value of information and information system services and products would also be measured so that one could then determine essential competencies based on their effect on performance, effectiveness and value. Decisions concerning hiring, salaries paid and expenditures for continuing education and training could all then be made on a rational economic basis. Ideally, newly required competencies could be continually determined for a particular work setting over time and in light of changes in the environment, user needs, new technology, and so on.

The Real World

Unfortunately, very little of this idealized process actually exists today. Few employers (particularly personnel officers) know which competencies are really necessary to perform librarian and information professional work, let alone how well librarians and information professionals perform, the effectiveness of their work or the higher order effects of information services and products. Some attempts have been made to determine competencies, but these attempts vary tremendously in terms of what is identified and described. Validation, other than by panel opinions, is almost non-existent. Since competency attainment resulting from university curricula and continuing education or training is not formalized, it is very difficult to determine current education and training requirements, let alone future requirements.

Furthermore, the entire cyclical process normally involves years, perhaps decades, to take place, because of a nearly total lack of competency definition, measurement, and standards, all of which are encumbered by the lack of communication among the principal participants: employers, educators and trainers, the research community, librarians and information professionals, professional societies, and students.

The Project Objectives in Light of Constraints

We began the project with full recognition that it is impossible to achieve a complete and idealized cycle of competency achievement within the scope of this project because a complete cycle, even with ideal definitions, measures and standards and open communication channels, would require some years to accomplish. Thus, we set out to accomplish five main objectives:

(1) Set forth an idealized framework that can be used by the librarian and information professional community to strive continually for achieving future required competencies.

(2) Determine a first set of librarian and information professional competencies which are validated in the workplace to some extent.

(3) Establish initial education and training requirements for the future.

(4) Initiate a process for communication among the principal librarian and information professional participants which can, hopefully, be continued after the project ends.

(5) Describe steps that can be taken in the future to ensure continuation of the competency achievement cycle.

The framework of the information environment and idealized processes for achieving competencies were described above. The general methods for accomplishing the remaining objectives and the specific methods employed by us are discussed below.

METHODS FOR DETERMINING LIBRARIAN AND INFORMATION PROFESSIONAL COMPETENCIES

As indicated above, there are four steps in determining librarian and information professional competencies: definition, identification, description and validation. Methods used for each of these steps are described below.

Methods for Defining Competencies

Libraries and information organizations comprise several resource components including people, information materials, equipment, facilities, supplies, etc. Libraries, in particular, are perceived by many people in terms of the information materials stored and made available to patrons. Yet, the keystone of an information organization is actually the organization's staff who ensure acquisition of useful and relevant information materials; manage and control the information so that one can gain access to it; and search, identify, locate and retrieve information from databases and other sources which describe millions of recorded information items found in libraries or elsewhere; and so on. Not only are information organizations highly labor intensive (i.e., labor tends to dominate organization budgets) but the staff also need substantial capabilities to perform at the high level that is required. The basis for such high level of performance is the competencies of the professional staff. Competencies of librarians and information professionals can be described in terms of three components: knowledge, skills and attitudes, which are defined below. These components are also categorized into groups that should have some meaning to educators, employers and librarians and information professionals who make use of descriptions of competencies.

The methods used for defining competencies began with an extensive literature search concerning competency development in the library field as well as other fields. From this literature review it was decided to define competencies as consisting of three components: knowledge, skills, and attitudes. These components were reviewed with the Advisory Group and a consensus was reached that they were the most appropriate ones for librarians and information professionals. We then categorized the competencies into several types of knowledge, skills and attitudes. These categories are described below.

For the purpose of this project we developed the following operational definition of knowledge:

> **Knowledge is having information about, knowing, understanding, being acquainted with, being aware of, having experience of, or being familiar with something, someone or how to do something.**

We identified several types of knowledge that are necessary to perform information work satisfactorily as follows:

- Basic knowledge in such areas as language, communication, arithmetic operations, etc.
- Subject knowledge of primary subject fields of users served such as education, medicine, chemistry, law, etc.
- Library and information science knowledge such as the definition, structure and formats of information, etc.
- Knowledge about information work environments such as the information community, its participants and their social, economic and technical interrelationships, etc.
- Knowledge of what work is done such as the activities required to provide information services and produce information products, etc.
- Knowledge of how to do work such as how to perform various activities, apply techniques, use materials and technology, etc.
- Knowledge of the organization or user community served such as the mission, goals and objectives of the user or the organization, user's information needs and requirements, etc.

Such knowledge is largely acquired by librarians and information professionals through formal education and experience, although some knowledge such as specific "how to" knowledge comes mostly from training. Some knowledge, such as knowledge of the organization or user community served, is work-related and can be acquired through on-the-job training or experience. However, the fact that work-related knowledge is found to be very important to successful work performance should be taught as a part of formal education.

The operational definition of skill that we used for the project was:

Skill is the ability to use one's knowledge effectively.

There appear to be three kinds of skills necessary to perform information work satisfactorily:

- Basic skills such as cognitive, communication, analytical, etc.
- Skills related to each specific activity being performed such as negotiation of reference questions, evaluation of search outputs, etc.
- Other skills such as managing time effectively, budgeting and making projections, etc.

Skills are acquired largely through training and experience, although knowledge gained during formal education is accompanied by training for acquisition of needed skills.

Attitudes of librarians and information professionals are found to be extremely important to work performance.

The operational definition we used was:

Attitude is a mental or emotional approach to something or someone.

We have found it useful to subdivide attitudes into:

- Dispositional attitudes toward one's profession, the organization served, one's work organization, and other people such as users and co-workers.
- Personality traits/qualities such as confidence, inquisitiveness, sense of ethics, flexibility, etc.
- Attitudes related to job/work/organization such as willingness to accept responsibility, willingness to learn, desire to grow, etc.

Attitudes are largely acquired through experience, but can be altered through proper education and training. Any formal education should place a premium on conveying a sense of professionalism and the importance of attitudes in achieving satisfactory job performance.

Methods for Identifying and Describing Librarian and Information Professional Competencies

Identifying and describing competencies are considered together here since the methods employed were essentially the same for these two steps. One of the first issues that was addressed by the Advisory Group and Project Team was the determination of what the term "professional" meant in the context of this project. After considerable discussion it was agreed that the MLS[*] (or equivalent Master's degrees) be considered the first professional qualification. This meant that the entire project focused on the education, training, and subsequent performance of librarians and information professionals possessing a Master's level degree.

A second issue addressed the level of analysis of librarian and information professional competencies identified and validated. After considerable discussion the Advisory Group recommended that we identify librarian and information professional competencies according to the following dimensions:

(1) Work settings including libraries (public, academic, school and special), clearinghouses, database producers, publishers, archives, museums, and units where the librarians and information professionals operate as part of a larger team (e.g., research, law, medicine, etc.)

(2) Functions performed such as reference, management, acquisitions in libraries.

(3) Level of professional activity which includes entry level (one to three years experience), mid-level (four to nine years experience) and senior level (ten years or more experience).

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[*] Master of Library Science

Further, it was strongly recommended by the Advisory Group that we should describe exemplary rather than merely minimum professional competencies. After competency description began, we felt that the competency descriptions should be accompanied by corresponding detailed descriptions of activities performed for each function. This was done to help ensure that all important competencies were identified and to assist in validation of the competencies by professionals in the workplace by reducing redundancy in the listings.

The Request for Proposal did not permit a full-scale survey for identifying or validating the competencies. Instead, with the recommendation of the Advisory Group, we identified competencies from a small group of advanced organizations (i.e., organizations that were at the state-of-the-art in information handling and technology) from each major work setting. Nominations for such advanced organizations were made by members of the Advisory Group, from KRI's experience (including a large number of surveys) and were solicited from professional societies and opinion leaders in the field. Representatives from a total of 43 organizations were interviewed by Dr. Jose-Marie Griffiths (Project Director) or Donald W. King. They included at least one, and up to 20, interviews from each of the following types of work settings: public libraries, academic libraries, school libraries, special libraries, work settings where a librarian(s) or information professional(s) serve a work unit, clearinghouses and information analysis centers, database producers, publishers, museums and archives.

The interviews conducted at each work setting usually involved a manager or supervisor and at least one librarian or information professional who was designated by the manager as being exemplary or superior in his/her work. This procedure was selected in order to help ensure that the competencies identified represented the Advisory Group's recommendation that exemplary rather than minimal competencies be identified. Of course, in some instances small organizations have only one or two persons so that the manager was the librarian or information professional as well. The interviews with the managers involved collecting data about the organizational environment within which the librarians and information professionals work: functions performed, number of information workers and professionals in each general functional area, professional levels, staffing patterns and trends, and educational backgrounds of professionals. Managers were also asked to indicate required professional competencies by each general functional area, their opinions concerning trends in competency requirements and competencies which are difficult to find. They were asked about their hiring practices, methods used, criteria specified, and how these practices vary by general functional areas. They were also asked to indicate how well librarians and information professionals were prepared on entering their organization; what was lacking; how the professionals were prepared, if lacking; how long it took to prepare the librarians and information professionals; what in-house development programs were used for orientation, formal training and continuing education and training; what other ways are used to support professional development (e.g., university education, professional societies, workshops, etc.); what career paths are available for librarians and information professionals; and criteria used for evaluation and promotion of librarians and information professionals. Finally, the managers were asked to indicate prevailing trends they saw in the field and how the information functions they performed would change as a result.

The second level of interview involved specific librarians and information professionals and the detailed functions they performed. In some instances, the managers were also the subjects of the second level interview in order to determine management competencies. The second level interview was conducted in two phases; one involving details of the librarians and information professionals and their work and the second concerning in-depth probing of critical incidents of exemplary work. The first phase collected data about the librarians' and information professionals' functions performed, educational background, work experiences, professional activity and means of expanding technical knowledge and skills. Professionals were also asked their opinions of how well prepared they were on entering their careers (what did they lack, how did they overcome inadequacy of preparation, etc.), what they considered prevailing trends to be, and how they intended to cope with changes arising from these trends. Finally, questions about their career development were asked, including in-house programs, other ways they were supported in professional development, and their perception of career oportunities. The librarian's or information professional's perceptions were compared with their manager's indication of competency requirements, educational preparation, professional development, career paths and trends.

The librarians and information professionals were also asked to discuss specific critical incidents on the job in which they did a particularly exemplary job. In-depth probing of the circumstances surrounding these incidents concerning what they did, what they needed to know, what skills were required, and what attitudes affected the success of the job, etc. was used to gather detailed information. This approach was strongly endorsed by two members of the Advisory Group (John Kobe and Danny Lea) who had extensive experience in competency development in other fields. The critical incident method was demonstrated at an Advisory Group meeting. The librarians and information professionals were also asked to indicate specific tasks or activities that they perform in their work and the competencies needed to perform them.

In addition, librarian and information professional competencies were identified through secondary sources including journal articles, technical reports and reports of projects performed within specific work settings. As a result of these data collection efforts, approximately 9,000 statements of knowledge, skills, and attitudes were identified. Then we conducted several iterations to categorize the competencies into general types of knowledge, skills and attitudes. A first cut of this categorization was presented to the Advisory Group, a second published in American Libraries [Griffiths, 1984], a third presented to the ALISE group [Griffiths and King, 1984] and then another version prepared for validation packages which were mailed to interested persons and professional societies.

The individual competency statements, drawn from interviews and other sources, were then assigned to the categories and described. The descriptions were kept generic in keeping with recommendations of the Advisory Group. An attempt was made to describe the competencies in light of detailed activities. All of the competency statements then were described (reworded) to fit the general structure within the identified work settings, functions performed, levels of librarian and information professional experience, and categories of knowledge, skills and attitudes. Packages of these descriptions were then prepared for validation.

Methods for Validation of Librarian and Information Professional Competencies

There are two types of validation to consider in the process of achieving librarian and information professional competencies. The first type involves validating the definition, identification and description of competencies. The second type of validation involves the confirmation that courses of instruction relating to specific competencies will result in associated acquisition of knowledge, skills and attitudes. In the project we limited our efforts to validating the initial definition, identification and description of competencies, since, as indicated earlier, the project did not call for going beyond establishing requirements for education and training.

We think of validation as being the process of confirming that the acquisition of competencies defined will result in improved performance of librarians and information professionals, where performance is measured in terms of quantities produced (or productivity), quality, and timeliness. In the background literature search we found not only a somewhat limited number of competencies identified (or at least standardized), but also a paucity of measures of performance, let alone linkages (or correlations) of measures of competencies to measures of performance. Furthermore, the potential for validation was constrained in that a formal statistical survey was not permitted. Thus, in the project we limited the validation to a broad determination of validity of the described competencies by the Advisory Group and over several hundred interested librarians and information professionals. In order to ensure broad representation and input to validation we attempted to utilize the extensive communication that we had initiated at the start of the project. Calls for participation were made in press releases, journal articles and announcements, speeches and requests through professional societies. Several hundred librarians and information professionals volunteered to validate the large number of competencies identified and described.

The participants were asked to review the competency descriptions and indicate whether each was considered essential, desirable or not applicable. The participants were invited to modify competency descriptions and add missing competencies. They were also asked whether they thought the competencies would become more or less important in the future. In order to relate the competencies to specific work activities, detailed lists of activities to which the competencies related were provided as well. This helped ensure that some linkage to performance could be made, even if implicitly. Out of 407 validation packages sent to volunteers a total of 114 were returned. Only those competencies which were validated by at least ten individuals were considered validated and included in the analysis.

PROJECT FINDINGS

Sets of competencies were identified, described and validated for 22 functions in 12 work settings as follows:

WORK SETTINGS

Academic Library
Public Library
School Library
Special Library
Database Producer
Database Distributor/Service
Information Center/Clearinghouse
Records and Information Manager
Archive/Museum/Collection
Information Analysis Center
Information Service Company
Library Systems Supplier

FUNCTIONS

Acquisitions
Cataloging
Circulation and User Services
Collection Maintenance
Interlibrary Loan
Management
Reference
Serials Control
Thesaurus Development & Control
Indexing/Abstracting
Publications & Product Management
Exhibit Management
Organization/Management Support
Information Analysis/Research
Project Management
Reference/Analysis of Secondary Data
Research, Analysis and Design
Marketing
Customer Support
Reference/Information Analysis
Cataloging/Indexing
Research and Development

A total of over 8,800 individual competency statements were identified, described and validated.

In reviewing the validated sets of competencies, it soon became clear that certain competencies are required in more than one work setting or function. Three distinct sets of generic or transferrable competencies were identified:

- competencies that are generic across both function and work setting
- competencies that are generic across functions
- competencies that are generic across work settings.

We were able to identify competencies generic across six work settings and ten functions as indicated in Figure 2. (This does not mean that competencies are not transferrable across other functions and work settings. It reflects the requirement we imposed that, to be considered as validated, a competency had to have been evaluated by a minimum of 10 individuals.)

The competencies were further analyzed into those that were considered essential versus desirable (and the degree to which they were), and those that were considered to become more versus less important in the future (and the degree to which they were).

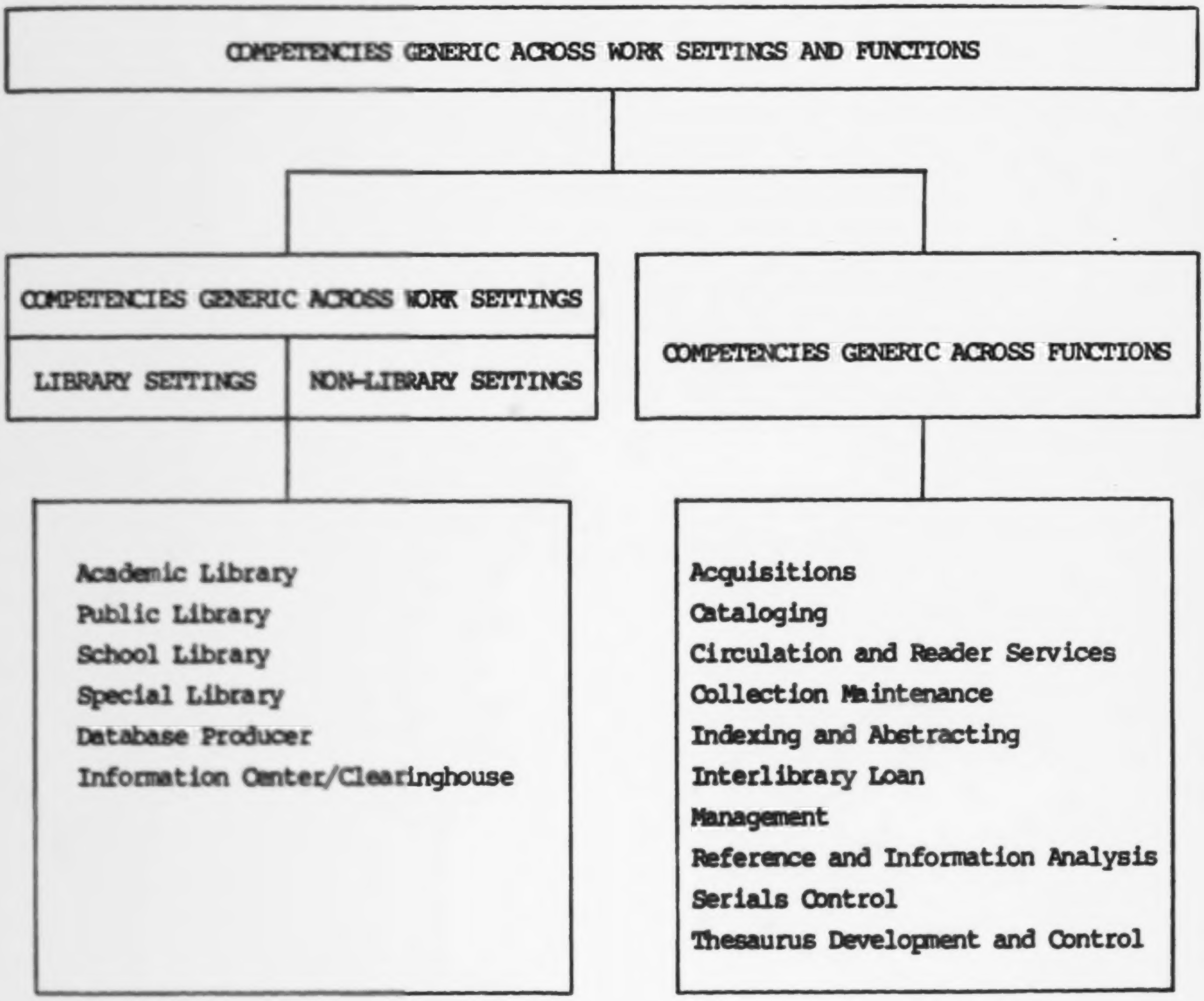
The competencies are organized according to the framework described earlier. In using the competencies, it is important to understand the distinction between functions performed and job titles. In this project, a functional approach was adopted as we were more concerned with what librarians and information professionals do than with what they are called. In using and interpreting the competencies (listed in their entirety in Volume 2 of the Project Report) it is important to consider the functions being performed by the professionals of interest and the activities they perform to determine which competencies are appropriate.

THE ROLE OF COMMUNICATION IN ACHIEVING LIBRARIAN AND INFORMATION PROFESSIONAL COMPETENCIES

One of the principal outputs on this project was to initiate communication among principal participants in the information community. Below we discuss this, as well as a complete process of such communication. In

FIGURE 2

GENERIC COMPETENCIES IDENTIFIED


COMPETENCIES GENERIC ACROSS WORK SETTINGS AND FUNCTIONS
COMPETENCIES GENERIC ACROSS WORK SETTINGS
LIBRARY SETTINGS
NON-LIBRARY SETTINGS
COMPETENCIES GENERIC ACROSS FUNCTIONS
Academic Library
Public Library
School Library
Special Library
Database Producer
Information Center/Clearinghouse
Acquisitions
Cataloging
Circulation and Reader Services
Collection Maintenance
Indexing and Abstracting
Interlibrary Loan
Management
Reference and Information Analysis
Serials Control
Thesaurus Development and Control

order to achieve new competencies in the information profession, a number of participants are involved. These participants include:

1) Employers of librarians and information professionals found in a wide range of information work settings such as libraries, clearinghouses, database producers, bibliographic utilities, publishers, information analysis centers, archives, museums, etc.

2) Education and training organizations such as university library schools, community college library schools, state libraries, library and information service vendors, companies specializing in education and training, professional societies, and in-house training departments.

3) Professional societies that represent the various information professions (e.g., all the library associations, information science societies, abstracting and indexing societies, etc.)

4) Researchers representing the information disciplines and education.

5) Librarians,information professionals and students.

Communication among these participants is essential to achieving new competencies on a real time basis.

As mentioned earlier, we consider communications to be at the very heart of achieving librarian and information professional competencies. The whole system of competency development is a matter of communication among the participants above. Currently, employers react (sometimes rather slowly) to changing technology and the environment by determining a need for certain information-related competencies. Then, universities (and other education and training organizations) modify their curricula and courses to reflect these changes, but often years (or occasionally decades) after needs and requirements have surfaced. Often there is a lack of communication between the workplace and educational and training organizations. For example, it has been found that many work settings have a need for traditional library competencies in non-traditional settings. However, employers are unaware of the potential supply of persons with such competencies acquired through library and information science education. And library and information science schools have often been slow to recognize this potential market for their students (partially because it was not communicated to them).

The general approach to the New Directions project was to develop a mechanism that will lead to improved communication among the participants so that competencies (which are both appropriate and timely) can be taught in education and training organizations. The communication mechanism should also inform participants as to the sources of the supply of, and demand for, competencies. We looked upon King Research's principal role in the project as being the change agent for, and facilitator of, the communication process among the participants. A portion of the competency achievement cycle was developed to identify, define, describe and validate competencies and to define education and training requirements which could be used in support of curriculum design and implementation. (Again, the potential indefinite repetition of the cycle after completion of the project is emphasized.) Throughout the initial two phases of the competency achievement cycle, there was extensive communication among the KRI Project Team members, Project Participants and others. The following project structure was used to enhance these extensive communication activities.

As communication change agent and facilitator, King Research attempted to serve as focal point for information gathering, information processing and information dissemination. The information gathering took many forms including literature reviews, interviews, validation in the work settings, etc. Information processing included information assimilation and intepretation; competency definition, identification and description. Information dissemination included distribution through mail, reports, newsletters, workshops, and conferences.

There were essentially three levels of project participation:

- Project Team, comprising King Research, the Advisory Group and Project Consultants;
- Project Participants, comprising organizations and individuals who chose to interact with the Project Team by providing information about their environments, competency requirements, etc., and reviewing project output on an ongoing basis. Some of these Project Participants, at a later stage, volunteered to act as test sites, to be observed, or to validate competency descriptions;

- Universe of Participants, which comprised the remainder of the potential participants in the communication process (work settings, education and training organizations, professional societies, librarians, information professionals, students and researchers).

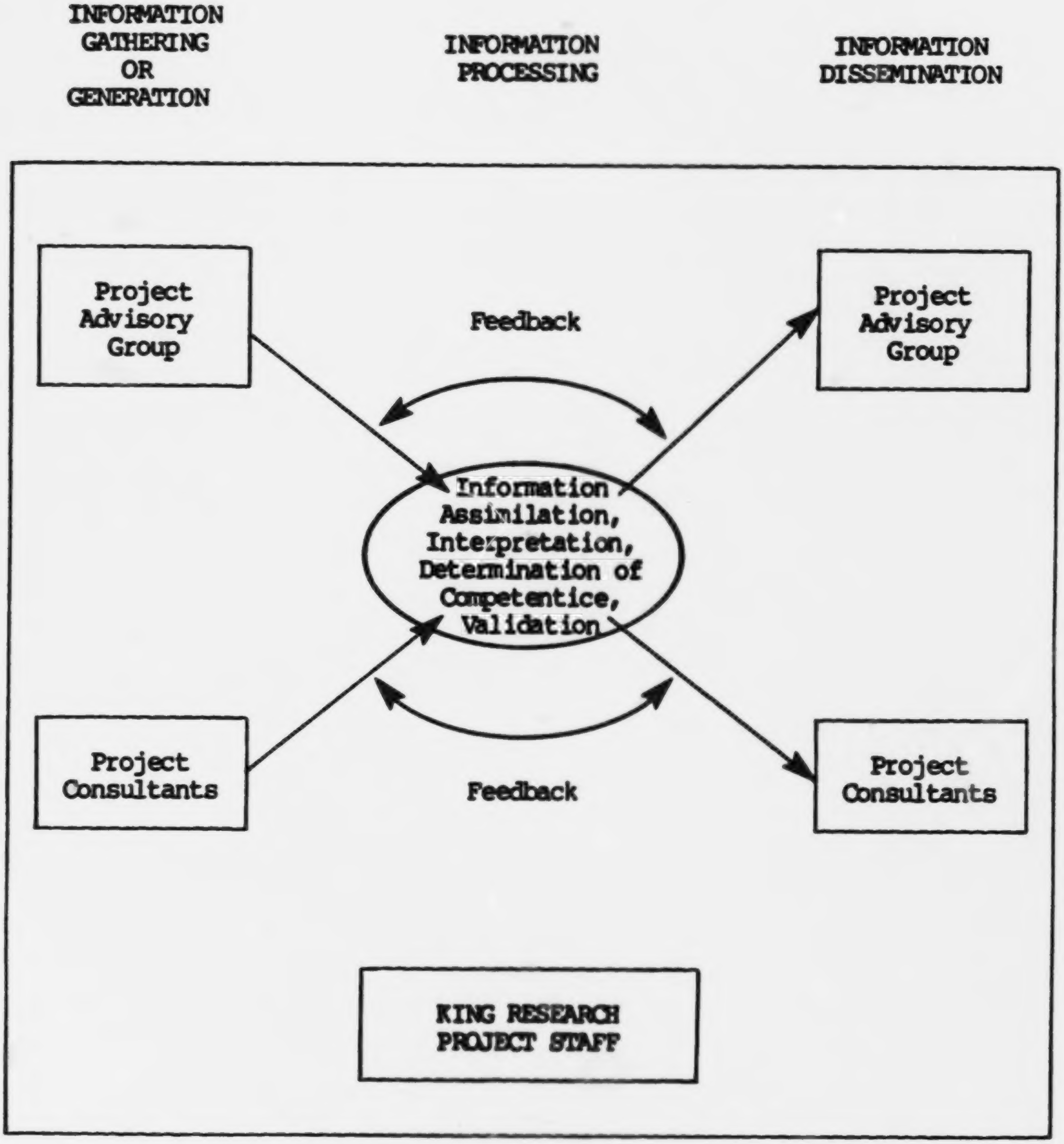
Below, we briefly outline the communication that took place at each of the three levels of participation.

Communication within the Project Team is depicted in Figure 3. Information gathering (and generation) was done by all the Project Team members. The information gathering included literature searches; identification of work settings, education and training organizations, professional societies, etc.; determination of competencies, reports, etc., and were also done cooperatively by all the Project Team members. In order to optimize the use of King Research staff, Project Advisory Group and Project Consultants, KRI staff usually initiated formal communications (such as first drafts of written reports) after informal communications with specific Project Team members. The text was then reviewed by the entire Project Team and subsequently made available to Project Participants for review and feedback. One of the roles of the Project Advisory Group and Project Consultants was for them to further communicate to other actual and potential participants.

The structure for communication among KRI Project Team members, Project Participants and Universe of Participants is given in Figure 4. Some of the communication with Project Participants (i.e., librarian and information professional work settings, education and training organizations, professional societies, research organizations and individuals within them) was used to define jobs, tasks, activities, and competencies; to establish competencies being taught and planned; to describe past, current and planned research and development of new technology and their effects on society. It also included all of the communication necessary to determine required competencies and define education and training requirements in the future. Communication with the Universe of Participants was established to inform the participants about new competencies and to make them aware of sources of supply and demand for

FIGURE 3

STRUCTURE FOR COMMUNICATION
AMONG THE KRI PROJECT TEAM MEMBERS


INFORMATION GATHERING OR GENERATION
INFORMATION PROCESSING
INFORMATION DISSEMINATION
Project Advisory Group
Feedback
Project Advisory Group
Information Assimilation, Interpretation, Determination of Competentice, Validation
Project Consultants
Feedback
Project Consultants
KING RESEARCH PROJECT STAFF

BEST COPY AVAILABLE

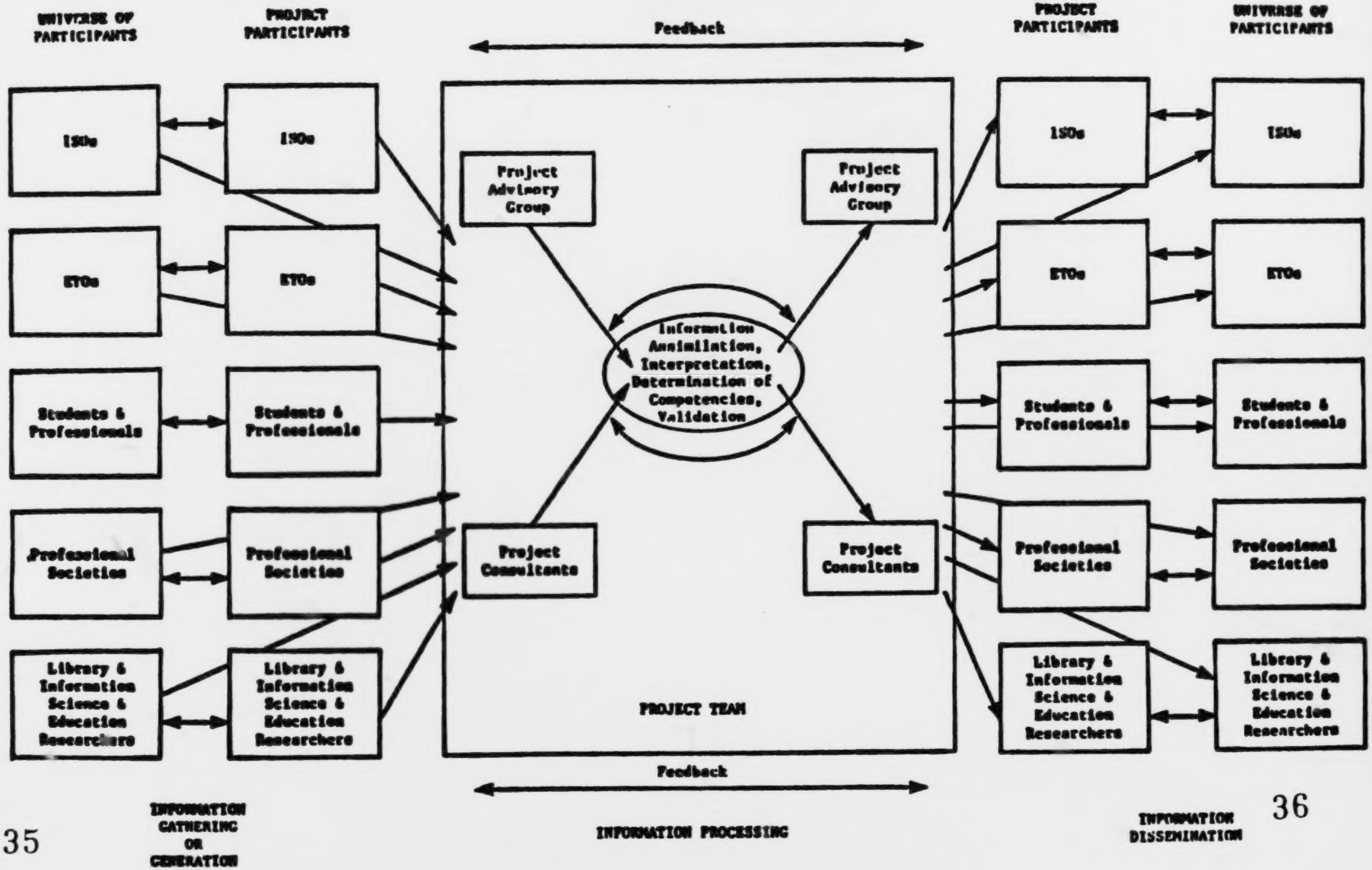

UNIVERSE OF PARTICIPANTS
PROJECT PARTICIPANTS
Feedback
PROJECT PARTICIPANTS
UNIVERSE OF PARTICIPANTS
ISOs
ISOs
ETOs
ETOs
Students & Professionals
Students & Professionals
Professional Societies
Professional Societies
Library & Information Science & Education Researchers
Library & Information Science & Education Researchers
Project Advisory Group
Project Consultants
Information Assimilation, Interpretation, Determination of Competencies, Validation
Project Advisory Group
Project Consultants
PROJECT TEAM
ISOs
ISOs
ETOs
ETOs
Students & Professionals
Students & Professionals
Professional Societies
Professional Societies
Library & Information Science & Education Researchers
Library & Information Science & Education Researchers
Feedback
INFORMATION GATHERING OR GENERATION
INFORMATION PROCESSING
INFORMATION DISSEMINATION

FIGURE 4: STRUCTURE FOR COMMUNICATION AMONG THE KRI PROJECT TEAM MEMBERS, PROJECT PARTICIPANTS AND UNIVERSE OF PARTICIPANTS

human resources with appropriate competencies. Such communication also served to establish feedback for refining existing competency descriptions; determining new competencies, for modifying education and training requirements, etc.

In initiating the communication process, we accomplished the following steps:

(1) Approximately 8,800 competencies were identified, described and validated for librarians and information professionals working in 12 different work settings.

(2) A project Newsletter was started and four issues were disseminated to over 600 persons. The Newsletter emphasized the project objectives and methods. It also discussed the progress of the project and changes that occurred during the project. Finally, results of Advisory Group meetings were thoroughly presented.

(3) There were three two-day meetings of the Advisory Group in Washington. Many of the methods employed in the project were a direct result of the Advisory Group discussions. Recommendations from the Advisory Group included: involving only generic competencies, identifying competencies from advanced work settings and exemplary librarians and information professionals and using the critical incident method for identifying competencies.

(4) A total of 35 presentations and discussions concerning the project were made before the ALA, ALISE, ASIS, SLA and several special library education conferences in the U.S., England, Norway, Taiwan and Yugoslavia.

(5) The validation process involved dissemination of 407 validation packages and feedback from 114 librarians and information professionals.

(6) The final report will be published and it was (or is scheduled to be) presented at several conferences in 1984 and 1985.

LIMITATIONS IN THE PROJECT APPROACH

It should be quite clear that the information provided by this project cannot, by itself, solve the competency achievement problem. One can think of the process described earlier in terms of scientific method, which includes the development of theory, predictions of new events, observations, and abstraction of essential elements to form the basis for a logical theory. What we have done is initiated the process through a step prior to the formulation of formal hypotheses, where measurable data gathering, analysis and interpretation are yet to begin. We have attempted to formulate a structure within which further research and refinement can more easily be achieved. Unfortunately, the entire process of exploratory information analysis has been overlooked in recent years by researchers. Part of this type of analysis includes describing phenomena, in much the same way botanists, biologists, chemists and other scientists have done in the early stages of development of their respective fields. Once formal classification and structures were determined, the scientific endeavor then proceeded to refine the structures and begin to formulate and test hypotheses in a formal way. It seems to us that the library and information field requires this first phase of formal structuring and classification before one can reasonably proceed to more formal scientific methods of analysis and interpretation. Below we describe briefly how the field might proceed into more formal quantitative modeling and analysis.

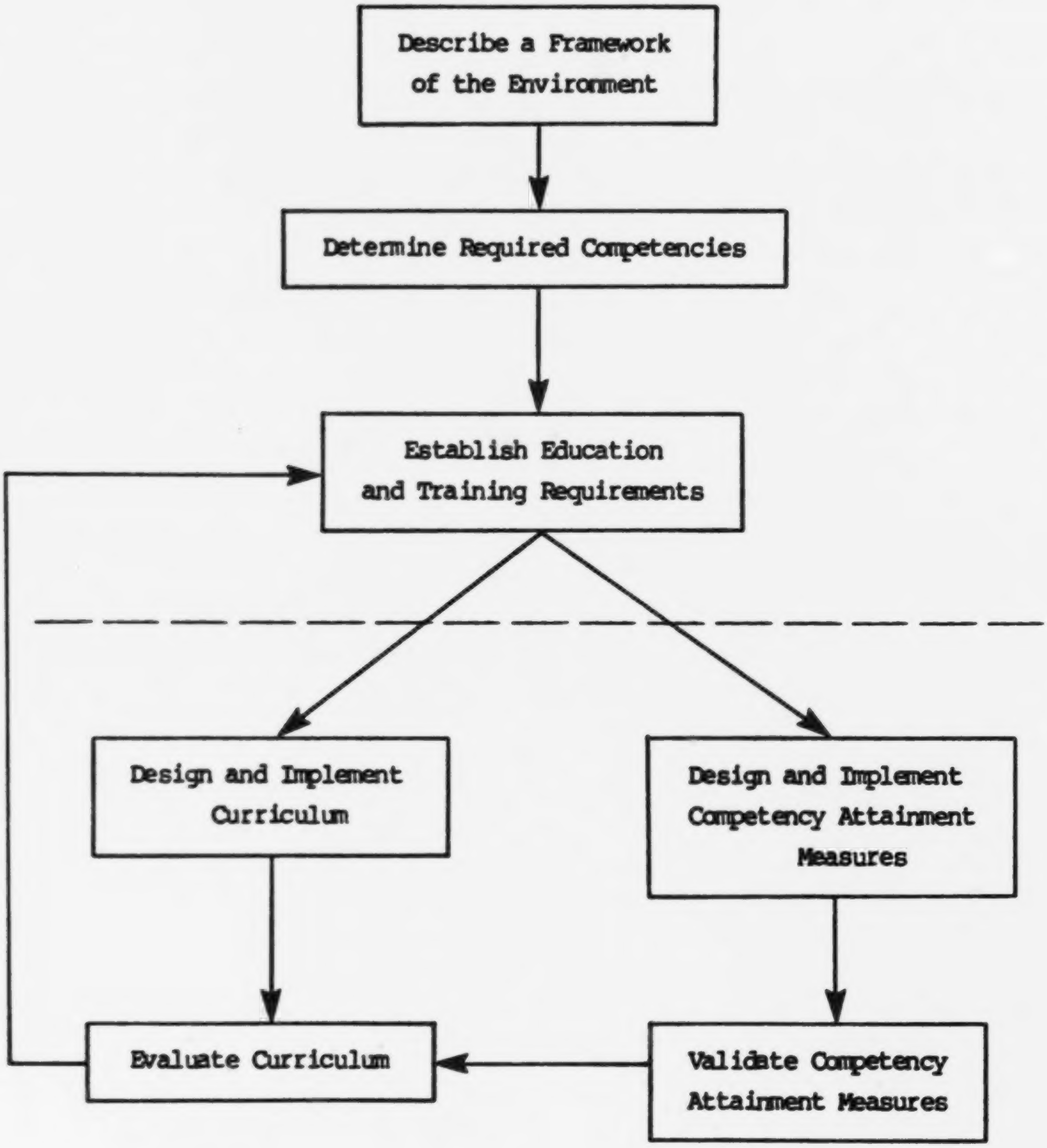
In our proposal we presented the steps displayed in Figure 5. We have discussed in some detail the three top steps in the figure: describing a framework for the information environment, determining required competencies, and establishing education and training requirements.

The steps below the dotted line have yet to be accomplished by the librarian and information professional community in a cohesive and standardized manner.

The assessment and program development process breaks down into two distinct but parallel branches of activity at this point. One branch involves the design and implementation of curricula, followed by their evaluation. These two activities are not directly addressed in this project. They are activities that should be performed within the education and training organizations themselves. However, the means for so doing were considered in the study through the second branch in the process. This branch consists of two activities which together enable the curricula to be evaluated. The first activity is the design and implementation of competency attainment measures, and the second is the validation of these measures.

FIGURE 5

COMPETENCY-BASED ASSESSMENT
AND PROGRAM DEVELOPMENT PROCESS


Describe a Framework of the Environment
Determine Required Competencies
Establish Education and Training Requirements
Design and Implement Curriculum
Design and Implement Competency Attainment Measures
Evaluate Curriculum
Validate Competency Attainment Measures

The ideal approach to curriculum development is to gear education and training to goals and competencies which have been established as relevant by means of an analysis of the competencies which actually distinguish superior performers in a given role or occupation, from average and ineffective performers. However, it is difficult (1) to measure "superior performance" in many areas and (2) to determine the underlying cause for the distinction between high and low performance.

Once a set of educational goals has been established, articulated and supported by a curriculum, student performance should be assessed and evaluated with respect to those goals. Whether based on multiple-choice tests, research themes, personal journal, various grading options, jury assessment, etc., evaluation always occurs. Some procedures for measuring competency attainment are used, and some standards of evaluation are employed.

The issue of assessment is particularly important because of the emphasis of competency based education programs on demonstration of the student's ability to apply acquired knowledge and skills. Such achievement is typically assessed by nontraditional means. To supplement traditional examination and team work, students are asked to demonstrate behaviors which are considered important to the future role for which they are being educated. Such procedures might be considered here for library and information science education.

For more formal validation in the work place, the field needs to relate competencies to work performance. Throughout the project, we attempted to show some conceptual relationships between competencies and performance of specific work activities, and then performance to effectiveness and higher order effects. There are four major steps that must be accomplished in the process. First, competencies, performance, effectiveness, and higher order effects must all be identified and quantified. Second, other factors related to performance and effectiveness must also be structured and taken into account. Third, the most important factors and relationships need to be discerned and, finally, the quantitative interrelationships or linkages should be established.

The principal outputs of education, training and experience are competencies attained by librarians and information professionals. At this stage we have established a listing of 8,800 competencies that appear to be related to performance of information work activities. In a sense, quantitative levels of essential, necessary and not applicable competencies have been established by practitioners in the workplace. What is necessary, then, is for the education community to establish ways of determining whether the competencies are being, should or can be taught, and to establish measures of the attainment of competencies. For example, attainment of knowledge could be determined through achievement tests or, at least by grading. Measures for basic skills such as fluency, numeracy and so on have been investigated and about seventeen marker tests have been established by the Educational Testing Service in Princeton. Activity related skills can be measured on the job in the work environment. Attitudes can also be measured, although the education community perhaps ought to be more concerned with conveying the importance of attitudes rather than measuring them. (Positive faculty attitudes towards the profession, for example, are extremely important.)

We feel that the principal measures of performance can be grouped by quantities produced, quality and timeliness. For example, with the activity of online searching, quantities produced might include the number of searches performed in a year; the quality of searching might be measured in terms of accuracy of searching (e.g., through recall and precision ratios); and timeliness measured in terms of the proportion of times a search is completed within a specified time (e.g., 95 percent of searches completed within three days). Obviously, there is a substantial degree of interaction among the performance measures. For example, number of searches conducted in a year will depend to some extent on the quality (or thoroughness) of these searches and a large number of searches required of a searcher may make it difficult to meet timeliness standards (as a result of the build-up of backlogs). It is emphasized that, aside from reference searching, there has been little research done on performance of information work activities, particularly those performed for technical and support functions.

Linkage of competencies to performance might be achieved as follows. In the most simplistic approach, one might try to relate a measure of performance to a measure of competence such as accuracy of search as a function of level of subject knowledge. However, level of performance is likely to be a function of several factors. Thus, a more appropriate model might be a multivariate regression model where the dependent variable would be a performance measure such as accuracy of search and the dependent variables knowledge (e.g., attainment of subject knowledge, knowledge of information retrieval approaches, knowledge of reference tools and how to use them, etc.) and attitudes (e.g., attention to detail, inquisitiveness, etc.). Again, attainment of knowledge can be measured by achievement scores, grades or even whether courses have been taken. The value of regression analysis is that it provides a method of at least determining which variables contribute to variation in levels of performance. More sophisticated approaches might include (1) controlled experiments where some factors can be controlled such as quantities produced (e.g., only search for fifteen minutes), difficulty of search, etc., (2) multi-aggregate regression analysis or (3) multi-attribute trade-off analysis such as conjoint measurement which determines the relative contribution made by the factors indicated as independent variables above, (e.g., see Appendix 3 of this volume).

Performance of searchers only indicates how well the searches are performed. One also needs to know how effective the searches are from the perspective of users. Presumably, better search performance will yield increased user satisfaction, repeated use of the search service and more use overall. User satisfaction could be measured in several ways such as Likert-like scales of satisfaction with accuracy, timeliness, etc. Repeated use and total amount of use can also be measured, but it may be necessary to normalize the results by the number of potential users since a large increase or decrease in the user population could yield misleading results.

It seems clear that the New Directions project provides a start, but a great deal must be done by the librarian and information professional community to achieve timely librarian and information professional competencies.

CHAPTER 2

A FRAMEWORK FOR DESCRIBING LIBRARIAN AND INFORMATION PROFESSIONAL COMPETENCIES

In this chapter we describe the environment within which the librarians and information professionals work, how their competencies affect their work and the entire environment within which they work. In particular, we give some examples that demonstrate how the competencies of a specific specialty of the information profession affect performance and, in turn, how the performance affects the information user being served. The ultimate effect of the librarians' and information professionals' work is the contribution that is made to the value of information from the perspective of users and of society in general.

The value of the information profession to the organizations served by it and to society is dependent on the capabilities of its individuals. In this study we attempt to provide information to educational institutions, employers, professional societies, librarians and information professionals to help them improve the capabilities of the profession. In order to do this, we have identified a very large number of librarian and information professional competencies (i.e., knowledge, skills and attitudes) necessary to conduct information work at a high level of performance. These competencies are identified for professional levels (entry, mid-level and senior), by work functions performed, and within different work settings (i.e., four types of libraries, records management units, etc.) Furthermore, in order to analyze, interpret and use the competency descriptions, we have formed a framework which serves to organize the competencies and which demonstrates the economic importance of the competencies of librarians and information professionals.

The information environment, of which competencies form an integral part, consists of the following seven-level hierarchy: (1) generic information functions, (2) librarian and information professional work settings, (3) the work functions performed in the work settings, (4) the information services and products provided through the work functions, (5) activities performed to provide the services and products, (6) resource components required to perform the activities, and (7) the essential characteristics of the resource components.

In this project we attempted, to the degree practical, to actually identify as many work settings, functions, services and products, activities, librarians, information professionals and their competencies as we could.

Probably the most important information resource component is personnel and the most essential characteristics of these people are their competencies. The reason for this is that information service performance (e.g., measured in terms of quantities produced, quality and timeliness) is highly dependent on the competencies of librarians and information professionals. The performance in turn affects the effectiveness of the information service in such terms as user satisfaction, repeated use and total amount of use. The purposes and amount of information use determine the value of the information (hence, the added value of the information services and products) and produce higher order effects such as an informed public, improved institutions and better education.

In this chapter we present some examples of how the framework is applied, focusing on libraries (as a work setting), reference (as a function), reference searching (as a service), conduct of searches (as an activity), the professional librarian (as a resource component) and competencies (as a characteristic of the resource component). We also attempt to illustrate that competencies are acquired through education, training, and experience, and that increased competencies yield higher work performance and greater effectiveness. Finally, since competencies and performance are both determined by the detailed activities of the work performed by librarians and information professionals, we have given a specific example of activities of the reference function and corresponding competencies necessary to accomplish the activities and, in turn, to achieve exemplary performance (example measures of which are also presented).

A CONCEPTUAL MODEL OF THE INFORMATION ENVIRONMENT

In order to fully understand information work and the relative importance of the competencies of librarians and information professionals, we describe the work performed by librarians and information professionals and corresponding competencies within a broader context: the environment within which librarians and information professionals work. A structure, or conceptual model, of the information environment includes a hierarchy of generic information functions and participants, information work settings, functions performed within the work settings, services provided and products produced as part of the functions, activities necessary to perform the services and provide the products, resource components needed to support the activities, and characteristics of the resource components. The highest level of the environment can be described in terms of nine generic functions that are associated with information processing, including information (1) correlation and formatting, (2) transformation; (3) recordation; (4) reproduction; (5) storage; (6) organization and control; (7) identification and analysis; (8) access; and (9) communication, as shown in Figure 6.

In order to achieve information communication between the creators and originators and the users an entire information community has evolved, comprised of organizations, librarians, information professionals and workers whose principal work is the processing or handling of information on behalf of others. Information is created by authors, composers, scientists and others but they are often assisted by librarians and information professionals such as editors, technical writers, speech writers and so on who correlate and format the information. This primary information may also be transformed, for example, from one language to another by translators, or from one numeric form to another by statisticians (or at least by those employing statistical methods). Catalogers correlate and format secondary information, and information professionals such as abstractors and indexers transform primary information into secondary information. The relationship between these generic information functions and other levels in the hierarchy is displayed in Figure 7.

Generic Functions and Work Settings

Once information is originated, in order to transfer it, it must be recorded and reproduced (and communicated). These generic functions are performed primarily by publishers of primary information (e.g., book and journal publishers and publishers of film and other audio-visual materials, etc.) and publishers of secondary information (e.g., bibliographic data

Figure 6. Information Processing Functions

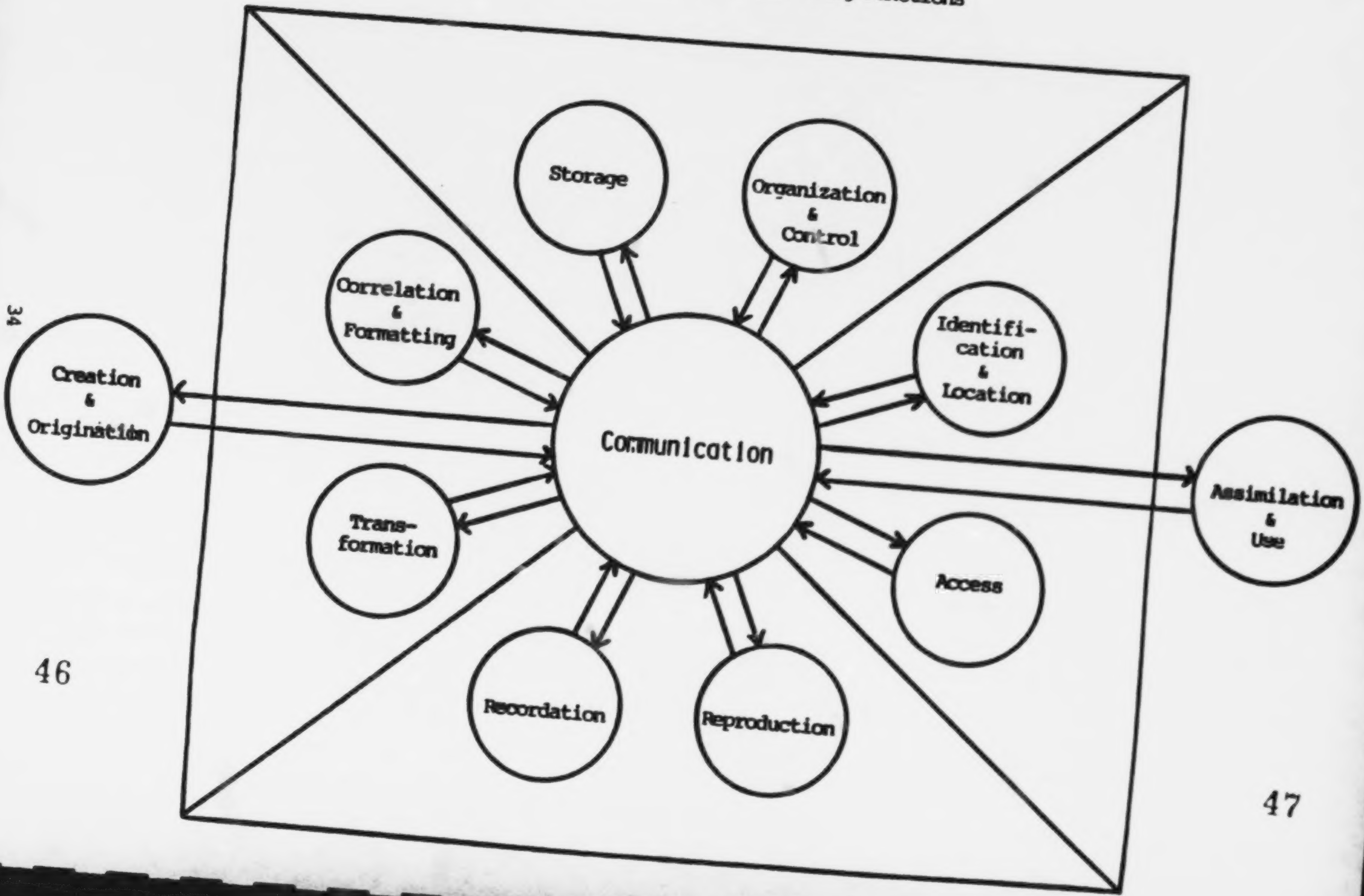

Storage
Organization & Control
Correlation & Formatting
Identification & Location
Creation & Origination
Communication
Assimilation & Use
Transformation
Access
Recordation
Reproduction

Figure 7. Examples of Information Functions, Work Settings, Library Functions, Services and Products, Activities, Resource Components and Characteristics

Examples of Generic Functions	Examples of Work Settings	Examples of Library Functions	Examples of Library Reference Services & Products	Examples of Library Reference Activities	Examples of Resource Components for Library Reference Search Service Activities	Examples of Characteristics of Resource Components of Library Reference Service Activities
Correlation & Formatting	Editing Units Tech. Writer Units Catalog Units*	**Technical** Acquisitions Document Processing Storage Circulation Recordkeeping	Referral	**Solicited** Interview users Develop research strategy Determine search method	**People** Professional Paraprofessional	**Competencies** Knowledge Skills Attitudes
Transformation	Translator Units Advertising Agencies Abstracting & Indexing Units*	ILL Request Placement	Question Answering	Determine source Conduct searches Review results Analyze results Provide results Translate titles/abstracts	**Equipment** Terminals Telephone Photocopying Audio/Visual	
Recordation and Reproduction	Publishers* Database Publishers*					
Storage and Organization Control	Banks Clearinghouses* Records Management Units* Archives*	**User related** Reference Physical Access to Materials Access to facilities User Training	Reference Searching	**Unsolicited** Develop unsolicited searches Conduct searches Evaluate searches Perform analysis Write summary Prepare public relations strategy Distribute published searches	**Communication Service** Database Network Vendor	**Background** Education Training Experience
Identification & Analysis and Access	Libraries* Search Units* Brokers* Museums* Computer Centers Information Analysis Centers*		Selective Dissemination of Information	**General** Keep abreast of sources/services Keep abreast of technologies Attend professional meetings Supervise staff Train staff & users Maintain & report statistics Develop charging strategies	**Materials** Reference materials Search materials Library Procedures Source materials	
Communication	Vendors Postal Services Classrooms Churches Theaters Sales Organizations Broadcasting Companies	**Support** Management Finance Accounting Personnel Research Technology Staff Training Public Relations			**Space & Furniture** **Supplies**	

* Work settings made a part of the project

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base producers, etc.). In order to provide information at a time convenient to end-users, the information must be stored, organized and controlled. These generic functions are performed by banks, records management units, clearinghouses, archives, and museums, as well as libraries.

The functions of identification and analysis, and access are considered together because they are so closely related (as are storage and access for that matter). Work settings that perform these functions include libraries, search units found in organizations (e.g., laboratories, hospitals, etc.), information brokers, museums, computer centers and information analysis centers (IAC's). Finally, we can identify a number of work settings for information professionals whose principal work involves information communication. Such settings include broadcast companies, classrooms, churches, theaters, and sales organizations that are concerned with direct communication of information that may or may not be recorded. Postal and other delivery services handle recorded information; and value-added utilities, bibliographic utilities (vendors), etc. are primarily concerned with communication of secondary information (although with the availability of full-text and numeric databases they are increasingly concerned with both primary and secondary information). The end-use of information takes place in many settings such as in the home, workplace, schools and so on. End-users are often assisted by librarians and information professionals such as searchers, information analysts and others.

Obviously, the boundaries between participants who perform various functions are becoming less distinct. For example, bibliographic utilities are involved in storage, organization and control, and access (as well as communication through value-added networks); publishers are involved in correlation and formatting through editors, and sometimes transformation through translation or graphics; and libraries store primary and secondary information and provide access to this information either directly or indirectly through photocopies. Thus, the classification of worksettings into the generic functions performed is rather arbitrary. However, the selection of work settings to be included in this project was based on a determination of where the types of librarians and information professionals of interest to the project perform their work. These work settings are designated by an asterisk in Figure 7.

Work Settings and Information Functions

Within each of the work settings selected for inclusion in this project, a number of basic functions have been identified. For example, referring to Figure 7, functions performed in libraries can be divided into technical functions (e.g., acquisitions, document processing, storage, etc.), user-related functions (e.g., reference, referral, physical access to materials, access to facilities, user training, etc.) and support functions (e.g., management, finance, personnel, public relations, etc.). In traditional organizational terms, the technical and user-related functions are line functions, and support functions are staff functions. The distinction is made between technical and user-related functions partially because the competencies of librarians and information professionals working with these two groups of functions are somewhat different, as are the cost and performance measures applied to them.

Information Functions, Services and Products

Several services and products may be provided within each of the functions. Generally, services are activities or processes performed for the benefit of users, whereas products are usually physical outputs provided to the users. The library technical functions provide services and products under the direction of library management in order to support the running of a library. How well these functions are performed only secondarily affects the library patrons' use of the library. On the other hand, user related functions are performed directly for library patrons and, therefore, the performance affects patrons directly. The support functions, in a sense, serve library management who in turn serve the library funders. The performance of support functions also affects the technical and user-related functions. Each function may have several services and products associated with it. Referring to the examples in Figure 7, the reference function could involve referral, question answering, reference searching and selective dissemination of information. A service of reference searching might be online database searching or catalog searching, and products might include the search output, a printed bibliography or catalog information.

The examples given here refer only to services and products related to functions performed in the library work settings. Similar examples could be derived for all the work settings and their respective functions. For example, the products of indexing and abstracting in the database producer work settings are sets of abstracts and indexes that are published in electronic and paper media. Information centers often provide state-of-the-art reviews as a result of reference and information analysis. Information service companies conduct research and produce research reports.

Information Services and Activities

Proceeding down the hierarchy to an even lower level, a number of activities (or tasks) must be conducted in a work setting in order to perform a service or provide a product. For the example given in Figure 7, activities for reference searching include interviewing users to evaluate information requirements, to determine budgetary and time constraints, etc.; developing and implementing a strategy for obtaining, evaluating, and packaging information and data to meet the user's needs; deciding on search methods (e.g., online and/or manual), and so on. The specific activities involved in reference searching can be sub-divided into those related to solicited searches and those related to unsolicited searches. In the former group, preliminary activities would include interviewing users, developing search strategies, determining search methods, determining sources of information, conducting the searches, reviewing search results, analyzing results, presenting results, and translating foreign language titles and abstracts (if necessary), etc. Activities related to unsolicited searches include developing unsolicited searches, writing summaries, etc. Other general activities include keeping abreast of information sources, services and technologies; training users; maintaining and reporting statistics; and so on.

The activities performed by librarians and information professionals form the basis for competency identification. They are pivotal also in that librarian and information professional performance is determined or measured through the activities. Thus, one can at least theoretically relate librarian and information professional competencies to performance and vice versa through the activities that are performed. More is said about these relationships later in this chapter. In the course of this project many hundreds of librarian and information professional activities were identified and validated. Some examples of these activities are provided at the end of this chapter, and the complete set is included in Volume 2 of this report.

Information Activities and Resource Components

There are many resource components necessary to support the performance of information work activities. Perhaps the most important resource (at least from the standpoint that it contributes to activities) is personnel. The personnel can be professional, paraprofessional or clerical, as shown in Figure 7. The work activities, as mentioned above, form the basis for identification of competencies of librarians and information professionals, who constitute only one of the resource components necessary to perform the work activities. Other resource components in the activity of conducting searches include other workers (e.g., paraprofessionals, clerical staff, etc.); equipment such as terminals, telephones, photocopying and audio-visual equipment; communication services such as database and vendor networks; materials such as reference materials, research materials, library procedure manuals, and source materials; space and furniture; and supplies. Activities describe what is done and resource components are who or what is necessary to perform the activities. In this project, we only identified librarians and information professionals and not the other resource requirements.

Characteristics or Attributes of Resource Components

Finally, the lowest level in this hierarchy describing the information environment includes characteristics or attributes of the resource components such as computer terminal speed or reliability, and (referring to the example of Figure 7) the competencies of the professional reference librarian.

A great deal of detail was necessary in order to identify and describe all of the competencies required by librarians and information professionals in the performance of their work. The hierarchical structure we have defined is useful to demonstrate that the foundation of the information environment is the librarians and information professionals within it, and the strength of the entire foundation is their collective competence. Their competencies determine how well an activity is performed (e.g., in terms of quantities produced, quality and timeliness), which in turn affects services or products, which affect the user, and so on.

LIBRARIAN AND INFORMATION PROFESSIONAL COMPETENCIES

Libraries and information organizations utilize several resource components including people, information materials, equipment, facilities, supplies, etc. Libraries, in particular, are perceived by many people in terms of the information materials stored and made available to patrons. Yet the keystone of an information organization is actually the organization's staff who ensure acquisition of useful and relevant information materials; organize and control the information so that one can gain access to it; and search, identify and retrieve information from data bases which describe millions of recorded information items found in the libraries or elsewhere; gain access to, analyze and turn over useful information to users. Not only are information organizations highly labor intensive (i.e., labor costs tend to dominate organization budgets) but the staff also require substantial capabilities to perform at the high level that is both necessary and expected. The basis for such a high level of performance is the competence of the professional staff. Competencies of librarians and information professionals can be defined in terms of three components: knowledge, skills and attitudes, which are defined below. These components can also be categorized into groups that should have some meaning to educators, employers, librarians and information professionals who make use of descriptions of competencies.

We have identified several types of knowledge that are necessary to perform information work satisfactorily as follows:

- Basic knowledge in such areas as language, communication, arithmetic operations, etc.
- Subject knowledge of primary subject fields of users served such as medicine, chemistry, law, etc.

- Library and information science knowledge such as the definition, structure and formats of information, etc.
- Knowledge about information work environments such as the information community, its participants and their social, economic and technical interrelationships, etc.
- Knowledge of what work is done such as the activities required to provide services and produce products, etc.
- Knowledge of how to do work such as how to perform various activities, apply techniques, use materials and technology, etc.
- Knowledge of the organization or user community served such as the mission, goals and objectives of the user or the organization, user's information needs and requirements, etc.

Knowledge is largely acquired by library and information professionals through formal education and experience, although some knowledge such as specific "how to" knowledge comes mostly from training. Other knowledge, such as knowledge of the organization or user community served, is work-related and can only be acquired through on-the-job training or experience. However, the fact that work-related knowledge is important to successful work performance should be taught as a part of formal education.

Skills are defined as the ability to use one's knowledge effectively. There appear to be three kinds of skills necessary to perform information work satisfactorily including:

- Basic skills such as cognitive, communication, analytical, etc.
- Skills related to each specific activity being performed such as negotiation of reference questions, evaluation of search outputs, etc.
- Other skills such as managing time effectively, budgeting and making projections, etc.

Skills are achieved largely through training and experience, although some skills must be acquired during formal education.

Attitudes of librarians and information professionals are found to be extremely important to work performance. We have found it useful to subdivide attitudes into:

- Dispositional attitudes toward one's profession, the organization served, one's work organization, and other people such as users and co-workers.
- Personality traits/qualities such as confidence, inquisitiveness, sense of ethics, tenacity, etc.
- Attitudes related to job/work/organization such as willingness to accept responsibility, willingness to learn, desire to grow, etc.

Attitudes are largely acquired through experience, but can be altered through proper education and training. Any formal education should place a premium on conveying a sense of professionalism and the importance of attitudes in achieving satisfactory job performance.

THE RELATIONSHIPS OF COMPETENCE TO PERFORMANCE, EFFECTIVENESS AND VALUE

Above we have tried to define competencies and point out that they are developed through education, training and experience. This relationship is depicted in Figure 8. Note that the level of competencies attained through education, training and experience depends on the capacity of an individual to learn and his or her motivation to do so. The principal reason, though, that a high level of competence is necessary for librarians and information professionals is to ensure that their work activities are performed at a high level. That is, to ensure that the mix of quantities produced (e.g., number of searches performed), quality (e.g., accuracy of searching) and timeliness (e.g., searches performed within a satisfactory negotiated time period) is accomplished at desired performance levels. Obviously the effectiveness, when measured from the perspective of the services' users, depends on performance. Higher performance will yield greater user satisfaction, more repeated use of the services and more overall use of the services. Studies have demonstrated that greater use of information yields increased value and other higher order effects, thus there should be a positive correlation between professional competence and effectiveness, value and other higher order effects [King, et. al., 1984].

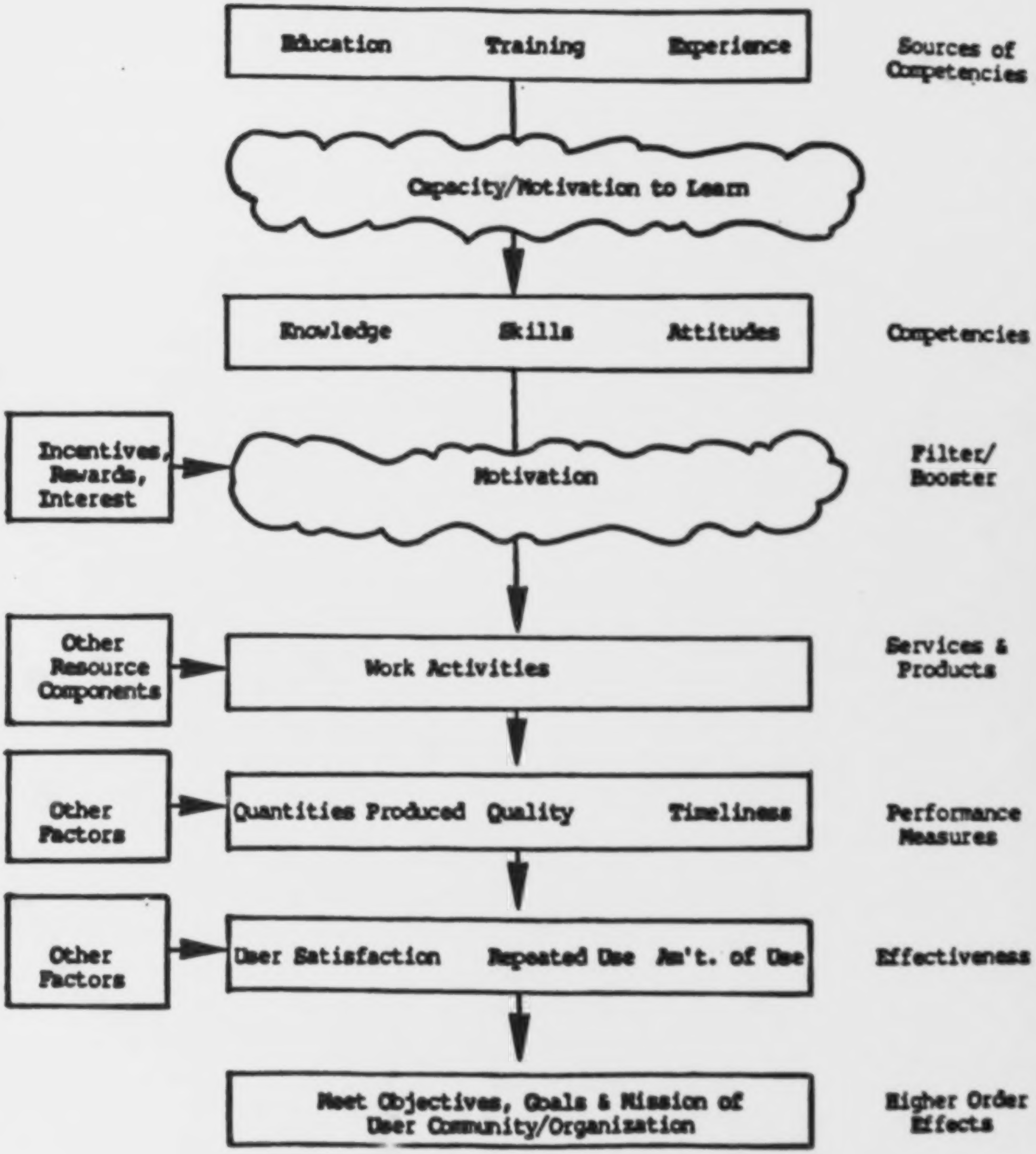
Education
Training
Experience
Sources of Competencies
Capacity/Motivation to Learn
Knowledge
Skills
Attitudes
Competencies
Incentives, Rewards, Interest
Motivation
Filter/ Booster
Other Resource Components
Work Activities
Services & Products
Other Factors
Quantities Produced
Quality
Timeliness
Performance Measures
Other Factors
User Satisfaction
Repeated Use
Am't. of Use
Effectiveness
Meet Objectives, Goals & Mission of User Community/Organization
Higher Order Effects

Figure 8. Relation of Sources of Competencies, Competencies, Services and Products, Performance Measures, Effectiveness and Higher Order Effects

One must not forget, however, that there are other factors which enter into the relationships among competencies, work activities, performance, effectiveness, value and other higher order effects. For example, the effectiveness of librarian's and information professional's competencies in performing work depends to some degree on that person's motivation. Motivation is partially determined by incentives and rewards (e.g., salary) as well as interest in the work. Other resource components are necessary to perform work activities as well, such as equipment and facilities. Improvements in the characteristics of these resource components should also increase performance, although the interface between the resources and the librarians and information professionals is important (e.g., resistance to new technology can be manifested in a variety of ways by librarians and information professionals including a deterioration of performance).

Other factors also enter into the level of performance that can be achieved. For example, good performance will depend on management personnel (and their competencies), the competencies of co-workers, resources made available, the physical work environment (e.g., heating, lighting conditions, etc.), and competencies (particularly attitudes) of users and interactions with them (including constraints of the interactions such as distance or communications channels). Finally, other factors such as user charges, currency of the information, quality of information (i.e., accuracy and precision) and awareness also influence the effectiveness of services in terms of amount of use made of the services. It should be reasonably clear that competencies are extremely important to performance and, hence, effectiveness and higher order effects. In the next section examples of competencies, detailed activities and performance measures related to reference search services are given.

Similarly, from an economic standpoint, one should be able to demonstrate that expenditures made to improve education and training generally or to educate or train an employee can be worthwhile in terms of improved competencies, performance, effectiveness and higher order effects (particularly, the value to users). The problem is that the information researchers have not yet investigated linkages between education, training and experience; competencies attained; performance of work activities attributable to competencies; effectiveness; value and other higher order effects. One would hope that this will be done in the future. Certainly, the information profession has matured to the point that such research is warranted.

AN EXAMPLE OF COMPETENCIES, WORK ACTIVITIES AND PERFORMANCE MEASURES

Examples are given below which illustrate the level of detail of librarian and information professional competencies described by us, as well as demonstrate the importance of presenting activities associated with the competencies. In the analysis of competencies it became clear that competencies presented in the absence of activities performed do not present a sufficiently clear picture to be used by educators, employers, professional associations, librarians and information professionals. Furthermore, we feel that it is useful to provide examples of performance measures which correspond to the activities to illustrate how performance might be affected by professional competencies. Competencies are organized by three experience levels of professionals — entry level (up to three years of professional experience), mid-level (four to nine years) and senior level (ten years or more).

Our intention is to demonstrate the relationships between competencies (i.e., knowledge, skills, and attitudes) and activities, and between activities and output performance measures (e.g., quantities produced, quality and timeliness). These relationships are depicted in Figure 9. A more concrete demonstration of this relationship is given through the following example.

Assume that the activity of interest is conducting a reference search. Further assume that one of the performance measures related to this activity is accuracy of the search. Examples of competencies that are necessary to perform the activity are subject knowledge, knowledge of information retrieval approaches, knowledge of reference tools and how to use them, and knowledge of the user's information needs; the ability to perform the activity; attention to detail, inquisitiveness, etc. It would appear that the greater degree to which a librarian and information professional had these competencies, the greater the accuracy that can be expected.

The competencies, activities and performance measures for the reference function in a special library are organized according to the structure shown in Figure 9. Note that the competencies, activities and performance measures are broken down by professional level (entry, mid-level, senior) and that they are cumulative. In other words, competencies of mid-level professionals include entries shown at the mid-level as well as all of those at the entry level.

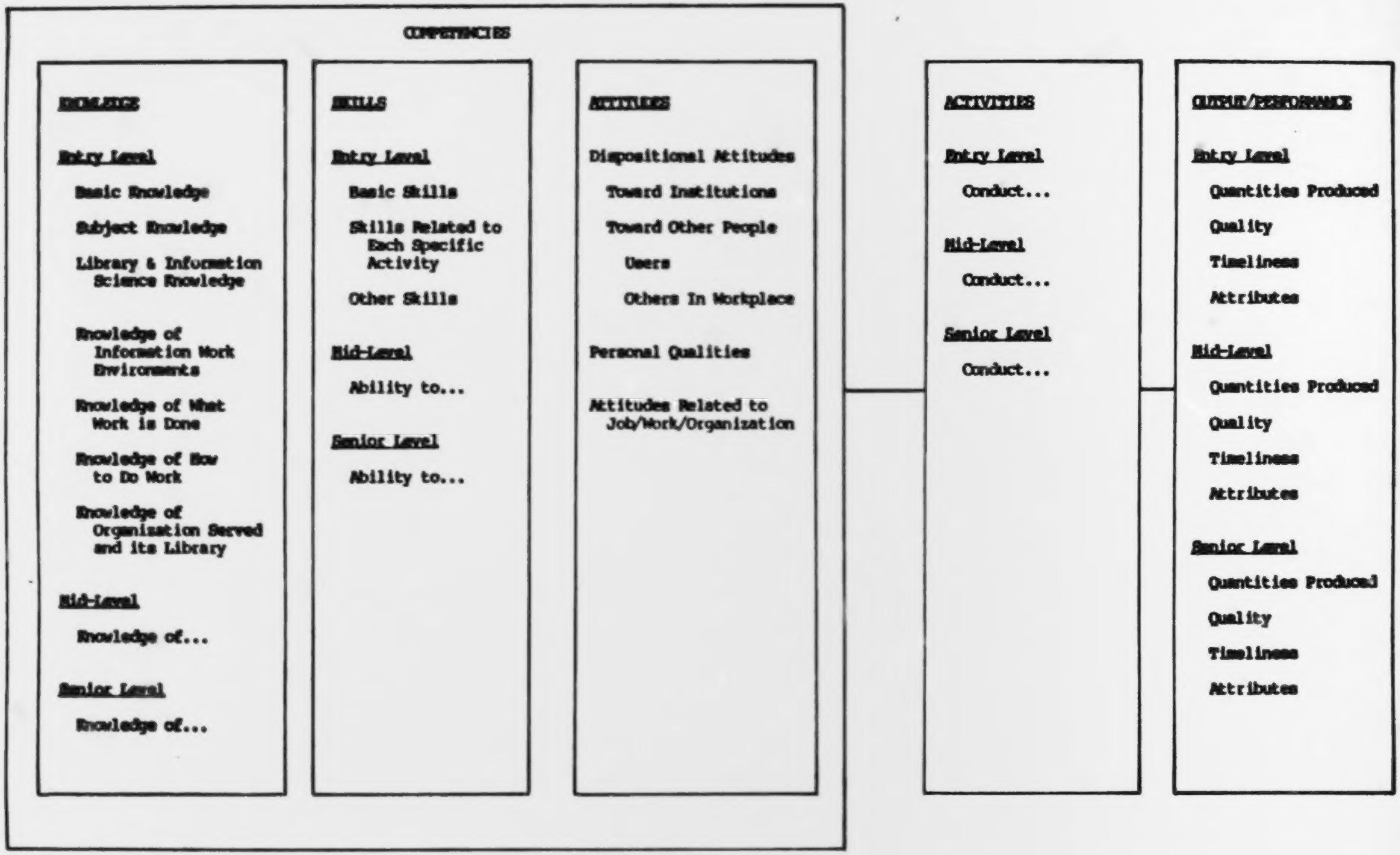
COMPETENCIES
KNOWLEDGE
Entry Level
Basic Knowledge
Subject Knowledge
Library & Information Science Knowledge
Knowledge of Information Work Environments
Knowledge of What Work is Done
Knowledge of How to Do Work
Knowledge of Organization Served and its Library
Mid-Level
Knowledge of...
Senior Level
Knowledge of...
SKILLS
Entry Level
Basic Skills
Skills Related to Each Specific Activity
Other Skills
Mid-Level
Ability to...
Senior Level
Ability to...
ATTITUDES
Dispositional Attitudes
Toward Institutions
Toward Other People
Users
Others In Workplace
Personal Qualities
Attitudes Related to Job/Work/Organization
ACTIVITIES
Entry Level
Conduct...
Mid-Level
Conduct...
Senior Level
Conduct...
OUTPUT/PERFORMANCE
Entry Level
Quantities Produced
Quality
Timeliness
Attributes
Mid-Level
Quantities Produced
Quality
Timeliness
Attributes
Senior Level
Quantities Produced
Quality
Timeliness
Attributes

Figure 9. Relationship Among Competencies, Activities and Performance of Activities

SPECIAL LIBRARIAN COMPETENCIES
REFERENCE FUNCTION

KNOWLEDGE

KNOWLEDGE

REFERENCE **ENTRY LEVEL**

Basic knowledge

knowledge related to literacy, numeracy, communications, etc.

Subject knowledge

knowledge of the primary subject field of users served (e.g., medicine, chemistry, law, etc.)
knowledge of foreign languages

Library & Information Science Knowledge (Generic)

knowledge of definition, structure, and formats of information
knowledge of alternative approaches to the organization of information
knowledge of alternative approaches to retrieval of information
knowledge of alternative approaches to information management
knowledge of available and emerging information technologies and their applications
knowledge of completed and ongoing research in the field and its applicability to practice
knowledge of career opportunities
knowledge of how to learn on an ongoing basis

Knowledge about information work environments

knowledge of the expanding information community, its participants and their interrelationships (social, economic, technical, etc.)
knowledge of the variety of work settings and their organizational structures
knowledge of the functions performed within the various work settings and the services and products offered
knowledge of the users of the services and products, their characteristics and information habits

Knowledge of what work is done

knowledge of the reference function, the range of services and products offered (both actual and potential)
knowledge of the activities that are required to offer the services and produce the products
knowledge of the various resources that are necessary to support the activities
knowledge of the reference/referral tools and sources of information
knowledge of reference/referral methods and techniques
knowledge of performance expected and how it can be measured
knowledge of job responsibilities and working conditions (e.g., range of duties, probable compensation, benefits, etc.)

KNOWLEDGE

REFERENCE **ENTRY LEVEL**

Knowledge of how to do work

- knowledge of how to perform the various activities (e.g., conduct reference interviews, analyze user requests, select reference sources, forumlate search, etc.)
- knowledge of how to use the reference/referral and other sources
- knowledge of how to apply the reference/referral methods and techniques
- knowledge of personnel procedures

Knowledge of the organization served and its library (or information center)

- knowledge of the mission, goals and objectives of the organization served
- knowledge of the structure of the organization and the role of the library (or information center) within the organization
- knowledge of the various projects and key personnel within the organization
- knowledge of the policies and procedures relevant to the library (or information center)
- knowledge of the various resources available within the library (e.g., personnel, equipment, etc.)
- knowledge of the users' information needs and requirements
- knowledge of the collection, and of related collections

REFERENCE **MID LEVEL**

- greater depths of knowledge specified above
- knowledge of the operations of other sections in the library and how they relate to reference
- knowledge of available vendor-supplied systems, services and products to support reference
- knowledge of the contracting process, both in general and within the organization
- knowledge of evaluation methods and techniques to evaluate systems, services and products
- knowledge of public relations techniques

KNOWLEDGE

REFERENCE **SENIOR LEVEL**

- greater depths of knowledge specified above
- knowledge of the statistical description, analysis, interpretation and presentation
- knowledge of the costs associated with library resources (materials, personnel, space, etc.)
- knowledge of cost analysis and interpretation methods
- knowledge of methods of resource allocation
- knowledge of standards, measures and methods for evaluating personnel
- knowledge of alternative management structures and their implications for the operation of the library
- state-of-the-art knowledge of library research and practice

SKILLS

REFERENCE ENTRY LEVEL

Basic Skills

literacy, numeracy, cognitive, analytical, communications, etc.

Skills Related to Specific Activities

Ability to:

- perform each activity
- establish rapport with users and colleagues
- communicate well by written, verbal and non-verbal means
- conduct an interview
- conduct meetings with individuals and groups
- collect, analyze and interpret data
- make decisions and recommendations based on available information
- supervise staff
- work independently and in groups
- develop criteria for evaluation

Ability to:

- make effective, timely and well-informed decisions
- isolate and define problems and develop the necessary criteria and action for their solution
- manage time effectively

REFERENCE MID LEVEL

Skills Related to Each Specific Activity

Skills listed above are developed to a greater extent

Ability to:

- perceive the needs of the organization and not just the library
- anticipate long-range needs of library
- design systems and procedures to improve library operations
- arbitrate and negotiate

REFERENCE SENIOR LEVEL

Skills listed above are developed to a greater extent

Ability to:

- apply methods of measurement and evaluation
- budget and make projections
- optimize the use of library resources

ATTITUDES

REFERENCE

Dispositional Attitudes

Attitudes Toward Institutions

Respect for profession
Respect for the library
Respect for the parent organization

Attitudes Toward Other People

Toward Users

Respect users
Like people in general
Like children
Like to help people
Like to meet people
Like to make others feel comfortable
Sensitive to others' needs

Toward Others in the Workplace

Respect co-workers
Like to work with others/as a team
Like to work on own
Willingness to draw upon and share knowledge and experience with others
Supportive of co-workers
Enjoy managing/supervising others

ATTITUDES

REFERENCE

Personal Qualities

Individual should possess:

- Alertness
- Assertiveness
- Compassion/Kindness
- Confidence
- Cheerfulness
- Dependability
- Determination/Tenacity
- Diplomacy
- Emotional stability
- Fairness
- Flexibility/Versatility
- Imagination
- Inquisitiveness
- Leadership ability
- Neatness
- Need for achievement
- Objectivity
- Open-mindedness
- Optimism/Positive attitude
- Organizational ability
- Patience
- Physical endurance
- Resourcefulness
- Sensitive/Thoughtful
- Sense of humor
- Sense of ethics
- Tolerance

ATTITUDES

REFERENCE

Attitudes Related to Job/Work/Organization

Individual should demonstrate:

- Willingness to take/accept responsibility
- Willingness to take initiative
- Willingness to respond to authority, apply and follow policy
- Desire to learn/try
- Willingness to fail
- Willingness to ask questions
- Desire to work to best of ability
- Responsiveness to time constraints
- Accuracy
- Willingness to get hands dirty
- Attention to detail
- Willingness to do clerical tasks
- Desire to follow-through
- Service orientation
- Organizational identity
- Willingness to promote library and its services
- View of library as part of a larger information environment
- View of library as an organization
- Ability to see broad picture
- Ability to sacrifice short-term gains for long-term goals
- Political sense
- Curiosity
- Variety of interests
- Desire to grow personally
- Desire to grow professionally
- Desire to remain current in specific and general subject field
- Positive attitude toward job

ACTIVITIES

LIBRARY, SPECIAL

REFERENCE

ENTRY LEVEL

Solicited Searches

1. Interview users to evaluate information requirements, and determine budgetary and time constraints, etc.
2. Counsel clients on specifying information requirements
3. Develop and implement strategy for obtaining, evaluating, and packaging information and data to meet users' needs
4. Decide on search methods (e.g., online and/or manual)
5. Decide on appropriate source (e.g., databases, printed publications, experts, etc.)
6. Conduct searches
7. Review results as appropriate or requested
8. Provide information for users in the form of references or source documents
9. Translate titles and abstracts
10. Refer users to higher-level reference staff, as appropriate
11. Refer users to other information services to recommend ILL, as appropriate

Unsolicited searches

12. Perform online searches according to SDI profiles

Other

13. Answer ready reference questions
14. Instruct users in reference methods, sources, services and policies
15. Alert users to non-print and in-house developed sources of information
16. Perform bibliographic verification as required
17. Recommend acquisition of materials for the reference and general collections

18. Distribute new accessions lists on a regular basis

19. Maintain reference searching statistics

20. Maintain financial data (funds received in payment for computerized retrieval, packaged literature searches and other products, or services for which charging may be authorized)

21. Keep abreast of new and changing reference sources, services and tools

22. Keep abreast of new and developing technologies applicable to reference searching

23. Attend professional meetings and prepare reports for dissemination to staff

24. Supervise technicians and other paraprofessional staff

MID LEVEL

Solicited Searches

25. Perform more complex searches

26. Analyze search results as appropriate or requested

27. Provide additional information for users (e.g., in the form of critical annotations, abstracts, analytical reports, etc.)

Unsolicited searches

28. Assist in developing broad-scope, published literature searches with executive analyses, resulting from anticipation and recognition of other information needs

29. Identify topics and develop search strategies

30. Conduct searches

31. Evaluate search results

32. Prepare search for publication

33. Distribute search results

Other

34. Work with users to develop SDI profiles

35. Interact with users to suggest changes in SDI profiles

36. Organize and maintain reference source files

37. Devise tools and displays which will ease access to collections and motivate use

38. Supervise junior staff

SENIOR LEVEL

Solicited

40. Review solicited searches performed by others and suggest additional search strategies as appropriate

41. Refer users to subject experts as appropriate

Unsolicited

42. Review unsolicited searches performed by others and suggest additional search strategies as appropriate

43. Prepare executive analyses for published searches

44. Arrange for publication

45. Develop a public relations strategy for marketing the publication

46. Develop distribution list

47. Develop announcement of publication

Other

48. Interact with colleagues and subject experts in identifying unrecorded/unindexed sources of information and data, and report to staff

49. Review and weed the reference collection on a regular basis

50. Analyze statistics and prepare statistical reports

51. Develop charging strategies

52. Analyze financial data and prepare financial reports

53. Handle deposit of funds

54. Supervise reference personnel

55. Review/evaluate performance of reference personnel

OUTPUT/PERFORMANCE MEASURES

ENTRY LEVEL

Quantities produced

- number of solicited online and manual searches
- number of items translated
- number of people supervised

Quality

- accuracy of source selection
- accuracy of searching
- accuracy of search review
- accuracy of search analysis
- accuracy of translation
- quality of staff supervision

Timeliness

- response time to initial request
- duration of user interview
- time taken to deliver search package to user (usually negotiated with user)

Attributes

- format of search package

MID LEVEL

Quantities produced

number of analyzed information packages
number of unsolicited searches performed
number of copies of unsolicited searches distributed

Quality

accuracy of complex searches
accuracy of analysis of search output
appropriateness of topics for unsolicited searches
accuracy of unsolicited searches

Timeliness

time taken to deliver analyzed package to user (usually negotiated with user)
meet unsolicited search and publication schedule

Attributes

format of analyzed package
format of unsolicited search publication

SENIOR LEVEL

Quantities Produced

number of search performances reviewed
number of executive analyses written
number of public relations strategies developed
number of distribution lists developed
number of announcements developed
number of people trained
number of unrecorded information sources identified and reported
number of statistical reports prepared
number of financial reports prepared
number of accounts handled
number of charging strategies developed
number of people reviewed/evaluated
number of items recommended for acquisition

Quality

quality of search performance reviews
quality of executive analyses
appropriateness of public relations strategies
comprehensiveness of distribution lists
quality of announcements
increased competencies
usefulness of unrecorded information sources
accuracy and completeness of statistical reporting
accuracy and completeness of financial reporting
appropriateness of charging strategies
quality of personnel reviews/evaluations
appropriateness of items recommended

Timeliness

time taken to review search performance
meet publication schedule for executive analysis
meet schedule for public relations strategies, distribution lists and announcements
meet schedule for training
meet schedule for statistical and financial reports
meet schedule for personnel reviews/evaluations
meet schedule for acquisitions recommendations

Attributes

agenda format and materials for training
categories included and length of statistical and financial reports
categories included and length of personnel evaluation form

CHAPTER 3
METHODS

In Appendix 1 of this report we discuss several studies relating to the identification, description and validation of competencies in general, and of the competencies of librarians and information professionals in particular. Many different approaches to competency definition, identification and validation have been developed over the years which vary in degree of sophistication and applicability to different environments. In this chapter we describe how we identified the different methods, how we selected methods to use in this project, and how we applied them in order to fulfill the project objectives.

METHODS USED TO REVIEW THE UNIVERSE OF INFORMATION

The first three months of the project were devoted to an extensive review of information concerning professional competencies of librarians and information professionals, as well as background materials that related to those competencies. Several sources for such information were exploited, including the published literature, unpublished research reports and, in particular, reports of other studies and projects funded by the U.S. Department of Education's Office of Educational Research and Improvement, Center for Libraries and Educational Improvement, Division of Library Programs and the Library Research and Demonstration Program.

The published literature was identified through the use of secondary information services and products, such as the Annual Review of Information Science and Technology, the Bowker Annual of Library and Book Trade Information and the following databases:

ERIC (Educational Resources Information Center)

LISA (Library and Information Science Abstracts)

AIM/ARM (Abstracts of Instructional and Research Materials in Vocational and Technical Education)

SPIF (School Practices Information File)

Guidance Information System
California Instructional Improvement Information Service
Education Database
British Education Index
NICEM (National Information Center for Educational Media).

In addition to these databases we contacted the following sources of information outside the library and information science field:

UCIDT (University Consortium for Instructional Development and Technology)

NCRVE (National Center for Research in Vocational Education)

ASCD (Association for Supervision and Curriculum Development)

NAIEC (National Association for Industry-Education Cooperation)

ECCMC (East Central Curriculum Management Center)

APGA (American Personnel and Guidance Association)

AVA (American Vocational Association)

CAEL (Council for Advancement of Experimential Learning).

A major resource for task analyses is the Vocational/Technical Education Consortium of States (V-Tecs) based in Atlanta, Georgia. Its purpose is to provide sound information from task analyses to program planners and curriculum developers. Members on payment of the annual fee, $20,000, are entitled to a copy of the V-Tecs catalogs which contain performance objectives and guides in the selected area; and the new member must, in turn, produce a catalog in an area judged high priority by V-Tecs. V-Tecs catalogs are the end result of task analyses of specific job titles, coded for access in accordance with the Department of Labor's Dictionary of Occupational Titles and the Department of Education's vocational coding system. Unfortunately, we discovered that the V-Tecs catalogs do not cover librarians and information professionals.

Unpublished information was identified in several ways. The first was through our Advisory Group and consultants. We circulated a list of items identified to date, and asked the group members to add further sources of information of which they were aware. Both Advisory Group members and consultants continued to pass on relevant information to us throughout the project. The second way was through the various professional societies both in the information and education professions. Members of our Advisory Group, project team and consultants, were particularly helpful in enabling us to make contacts very quickly with the following organizations:

- American Association for the Advancement of the Humanities
- American Association for the Advancement of Science
- American Association of Law Libraries
- American Association of School Librarians
- American Federation of Information Processing Societies
- American Library Association
- American Society for Information Science
- Association for Computing Machinery
- Association for Educational Communications and Technology
- Association for Library and Information Science Education
- Association of College and Research Libraries
- Association of Information Managers
- Association of Records Managers and Administrators
- Association of Research Libraries
- Continuing Library Education Network and Exchange
- Council of National Library and Information Associations
- Federal Library Committee
- Information Industry Association
- International Federation of Library Associations & Institutions
- Medical Library Association
- National Commission on Libraries and Information Science
- National Federation of Abstracting and Information Services
- Public Library Association
- Society of American Archivists
- Special Libraries Association
- Various regional and state-level associations

Many of these societies have themselves sponsored studies and most have special committees dedicated to the education and training of professionals. In addition, our combined team had representation on the Manpower Consortium for the Information Professions, and the SCOLE Task Force on Library Education Research. This latter group was set up to review recent research studies on library education (including this project) and compile a bibliography; to poll ALA education-related units on information needs; to develop a list of issues related to library education research and suggest ways SCOLE can promote accomplishment of research goals.

A further source of information that we identified was the Education Objectives Exchange located at the University of California. It operates an on-line database of professional competencies indexed by instructional area. Unfortunately the database had no defined category of librarianship or information science, information management, etc.

More information was obtained from a review of educational standards and professional standards as defined, for example, by the professional associations, and Office of Personnel Management in its recent proposed changes to the personnel classifications for the librarianship series. Several members of our Advisory Group were actively involved in reviewing these proposals and in the preparation of formal responses.

Finally, considerable progress towards compiling a complete bibliography had already been made by King Research, Inc. through the background research conducted in connection with related studies (a national systems analysis of scientific and technical communication, library human resources supply and demand, occupational survey of librarians and information professionals, resistance to technology in public libraries, new technologies in libraries, telecommunications and libraries, to name a few).

A very important source of unpublished information came from the study of information-related disciplines conducted by Machlup and Mansfield, consultants on the project. They analyzed and classified the academic content of a large cross-section of courses and programs in Information Science, currently being taught in institutions with a variety of names, most of which started out in life as library schools. They gathered data on the nature and timing of change and the philosophy behind the changes.

Another useful source of unpublished information came from unpublished data found in the occupational survey of librarians and information professionals and the surveys and modelling related to the library human resources study. Both of these studies gathered data that were highly appropriate to this project, but had not been analyzed with that purpose in mind. For example, Una Mansfield did a very interesting analysis of occupational titles and work-fields that has never been published. She conducted and analyzed about 50-100 in-depth interviews with personnel officers and information unit managers that generated results highly relevant to this project.

Although much of the review of available literature and other information relevant to this project was conducted at the outset, the process was continued throughout the project in an on-going fashion. Drafts of a Literature Review and Annotated Bibliography were prepared and distributed to the Advisory Committee and Consultants and on-demand to interested parties.

The reviewing of the published literature and unpublished research reports and data gave rise to a series of issues that we felt had to be addressed before proceeding to the next project task: that of identifying the competencies required by librarians and information professionals. To facilitate the decision-making process, a series of "issue papers" were generated by the Project Team and distributed to the Advisory Group and Consultants prior to the first Advisory Group meeting. Four major papers were produced. The four topics were:

- What is "competency"?
- Approaches to Identifying Competencies
- Minimum vs. Outstanding Competency
- Correlation and Causality

These brief papers are reproduced below.

Issue Paper #1 — What is "Competency"?

During the past decade, competency-based education (CBE) programs have been implemented at a variety of levels within the American educational system. However, if one were to ask educators involved with these programs exactly what competency-based education is, several quite different responses would be obtained.

In an effort to identify at least some elements of a common definition of CBE, Grant and his colleagues [1979], in evaluating some of the FIPSE-funded programs, suggested that "Competence-based education tends to be a form of education that derives a curriculum from an analysis of a prospective or actual role in modern society, and that attempts to certify progress on the basis of demonstrated performance in some or all aspects of that role". What that curriculum presumably teaches is a particular competence or a set of competencies — again variously defined as anything from "a task performed to a certain standard" [Maxwell and West, 1980] to "a generic knowledge, skill, trait, self-schema or motive of a person that is causally related to effective behavior referenced to external performance criteria" [Klemp in Pottinger and Goldsmith, 1979]. In all cases, "performance" is stressed as the means by which competence is demonstrated and assessed.

However, despite the general emphasis on performance, there is little clear agreement on exactly what aspects of performance a determination of competence is based upon. For those in vocational education, the emphasis is strongly upon mastery of essential job skills [e.g., Blank], arguing that it is the application of a given skill to the performance of a task which a consumer is paying for. Knowledge and attitudes are seen as supporting those skills, but not as being directly measurable in a determination of competence. A general emphasis on observable behaviors is often referred to as a behavioral objectives approach. This approach has, however, come under strong criticism by those who maintain that when carried to an extreme, it results in long lists of skills connected to particular kinds of jobs. The underlying assumption is that the acquisition of micro-skills somehow adds up to overall competence. Hence, some educators argue that competency may be based on the characteristics of an individual that underlie effective performance, such as knowledge, skills, traits, a self image or a motive [Klemp]; others [e.g., Pottinger] raise the importance of interpersonal and environmental variables in influencing behavior. Klemp in particular emphasizes that particular competencies do not exist in isolation from each other, but that effective performance is based upon the integration of several competencies. Further, in actual performance, various combinations of competencies may co-occur, producing functionally equivalent outcomes or performance.

In sum, when examining the components and methods of implementing CBE programs, or in simply identifying a set of educational goals, "the meaning attached to the concept of competence determines all else. If competence is defined as acquiring a set of facts or mastery of particular skills, a CBE program will be very different from one in which competency is regarded as the ability to function in a job or life role" [Nickse].

Issue Paper #2 — Approaches to Identifying Competencies

A generalized process for competency-based assessment and curriculum development was proposed by Huff, et. al. This process bears a striking resemblance to the planning process we propose to use. The first step in this education-oriented process is to define the institutional mission. This is usually achieved by setting goals. The next step is to identify the job or roles of interest to that mission and its goals. The third step is the determination of required competencies.

In identifying required competencies (both current and potential) it is important to consider the nature of competencies.

There are two basic types of competence:

(1) Specific Competencies — which relate to individual disciplines, such as cataloging, on-line retrieval, and reference skills in library and information science.

(2) Generic Competencies — which are applicable to any discipline, such as management and administrative skills.

Various methods have been utilized and recommended for the identification of individual competencies, one of which is the use of panels comprised of experts or practitioners in a given field to draw up lists of required competencies in that field, usually based on identification of those competencies which effective people possess. While often used and accepted, Pottinger terms this "the most popular and dangerous technique," although he offers little further explanation. By far one of the more explicitly detailed methods of determining competencies has been developed by vocational education programs — task analysis. Again, this may be variously defined and implemented, but the basic method is to identify a job and then break it down into its component parts. Davies calls the three types of task analysis topic, job and skill analysis, of which the first is concerned with the identification of intellectual tasks, the second with psycho-motor skills, and the third with how the job is accomplished. Maxwell and West also outline a number of steps involved in task analysis, based on a distinction between duties (major work functions) and tasks (actual units of work). Both duty and task listings are drawn up and refined by an advisory committee, followed by task detailing or specification of exactly what steps and knowledge an individual needs to be taught to perform a task successfully. Johnson [1977] also suggests observing workers on the job and tabulating tasks, and collecting and analyzing job descriptions. As might be expected from the criticisms of task-oriented competency development, task analysis has also been criticized as yielding only lists of minimal competencies or identification of threshold skills rather than optimal competencies associated with outstanding performance [Huff]. Several authors do note the practice of more than one approach in identifying competencies — for example, the University of Minnesota Pharmacology program has used task analysis to identify threshold performance and panels to identify aspects of good performance. A "thematic-analytic approach" used by the Navy and AMA programs is also noted by Huff. This approach considers competencies to be human characteristics that underlie effective performance rather than the observable behaviors themselves; hence the emphasis is on contrasting the actions, reactions, thoughts and attitudes of competent or outstanding performers in the same job to "discern competency themes that organize behavior in a variety of situations." Such competencies tend to be general and optimal in nature, rather than specific and/or minimal.

Issue Paper # 3 — Minimum vs. Outstanding Competency

In both defining competencies and determining measurement techniques to assess the attainment of competency, one of the major decisions to be made is that of determining the level of attainment which is desired or required. Is effective performance to be based on the attainment of minimal competencies or are higher standards to be set and outstanding competency required?

In the literature on the subject relevant to professional education and training, there are no clear-cut recommendations on how to establish competency levels and no way around the problem of having to make such decisions. Several considerations are raised, however, which may offer some guidelines for thinking about both competency identification and measurement procedures:

(1) Any determination of competencies must begin with a set of goals or objectives. The level of competence desired is related to those objectives — as objectives vary for particular educational programs and professionals, so will the nature of the performance required. Further, requirements may change; hence, the definition and measurement of competence may remain under frequent review.

(2) Several writers on the subject express the view that reliance on task analysis procedures to identify required competencies too often results in identification of minimal competencies rather than optimal competencies relating to outstanding performance. Panel methods which seek to identify the competencies manifested or held by particularly effective people in a job or profession shift the emphasis to outstanding performance, but run the risk of being more subjective. Some combination of objective and subjective methods may also be utilized, again linked to the ultimate objectives of the competency-identification effort.

(3) Caution must be taken in competency assessment by traditional testing methods which essentially test knowledge and/or ability to take tests. Just as minimum scores do not necessarily indicate someone will meet only minimum performance standards on the job, high scores do not ensure high work performance. In fact, in some studies, high scores have been negatively associated with performance. Raising cut-off points on test scores beyond some reasonable minimum is therefore not a method recommended for raising performance standards.

In practice, CBE programs in higher and professional education have tended to either opt for minimal competencies, identify both minimal and optimal competencies, or table the issue until further experience with a particular program is gained.

Issue Paper #4 — Correlation and Causality

The identification of a set of competencies considered necessary for effective performance in a job or profession must proceed from a particular understanding of the components of competency and interrelationship between competencies. The most frequently discussed components are knowledge, skills and attitudes. More complex concepts include such personality variables as traits, self-schemas, and motives as well as environmental and interpersonal variables. Whatever the chosen basis for identifying competency, the ultimate assessment of whether or not one possesses or demonstrates that competency relies upon one or, preferably, more measures. The problem then, in both identifying and measuring competencies, is how to sort out those competencies which merely correlate with effective performance and identify those which are actually in a causal relationship with that performance. For example, an individual may score highly on measures of knowledge, and may also be considered to be an outstanding performer on the job. However, the particular knowledge tested may only be correlated with and not be a real cause of particular work performance. In such a situation, it may be skills or motives which actually account for the demonstrated level of performance.

One approach to considering this issue is to develop competency models or sets of competencies which tend to co-occur in situations where effective performance is demonstrated. In any competency model, it is suggested, some competencies are causes of a particular level of performance while others have a partial effect on that performance. To determine the relationship of the competencies in a given model, they should be examined in pairs: "If a change in one competency changes the outcomes attributed to the presence of the other, but not vice-versa, it is a causal competency; if the reverse is true, it is a partial effect." [Klemp in Pottinger and Goldsmith, 1979].

Time consuming as this may be, it nevertheless indicates that ways of thinking about competencies can be devised which go beyond basic identification of knowledge, skills and attitudes and easy assumptions about the correlation of each with desirable performance. Indeed, in rapidly changing fields where knowledge and skills may be easily outdated, a close look at the competencies which are causally related to adaptability and continuous learning may be particularly worthwhile.

COMPETENCY DEFINITION

An individual's competence is judged by his or her performance. Regardless of the type of work performed, a competent individual is one who can meet or surpass performance standards, whether they be explicitly stated or implicit. Thus competence can only be identified through performance.

Klemp [1980] distinguishes between the way competence is ascribed to individuals and the way competence is measured:

> "Somewhere along the line, psychologists defined certain knowledges, skills and personality traits and developed measures for them. They found that these measures often corresponded with judgements of competency and decided, therefore, that the measures and the competence were the same thing. Granted, it appears that test scores, college grades and career performance inventories do predict entry into a given occupation. Nevertheless, once a person enters that occupation, none of those measures will reliably predict that person's performance." [McClelland, 1973]

Klemp continues by demonstrating that competence can be measured, but first competence must be defined and then operationalized in measurement. The dictionary defines competence as:

> "having requisite or adequate ability or qualities." [Webster's, 1975]

Originally, competence at a job was determined by a person's demonstrated ability to perform the tasks necessary to the job, to an acceptable standard. The traditional means of acquiring the necessary level of competence was through apprenticeship. Over time, however, competence began to be attributed on the basis of the knowledge people had. Thus the fact that someone had a knowledge of management was taken to imply that that person would be a competent manager. Obviously, knowledge contributes a great deal to a person's competence. But competence has become synonymous with knowing how to perform rather than demonstrating that knowledge. The result of this confusion between knowing and doing is that attempts to measure competence are often based on the inference of the ability to do from the knowledge possessed, rather than implying the knowledge, based on the demonstrated doing. The dictionary definition of competence implies that competence can not be measured directly, but can only be induced from an analysis of demonstrated behavior. A good test of competence, therefore, is one that would enable us to infer the same competencies as those to be inferred from the behavior of interest, that is both competencies of knowledge (content) and use (process).

In determining methods for identifying competence, we need to develop a more usable definition of competency that will allow us to be more precise about the attributes which we will be assessing. At the beginning of the project, a decision was made by the Project Team and Advisory Group to consider competencies at the non-trivial and transferrable level only. This decision was based partially on practical grounds and partially on relevance to the community. It was considered unnecessary to elaborate on all the detailed level (trivial) competencies, such as "the ability to use a telephone", when discussing professional competence. Further, we considered competencies to comprise three main components: knowledge, skills, and attitudes. Consequently, the following operational definition of competency was arrived at:

> **A competency is a generic knowledge, skill or attitude of a person that is causally related to effective behavior as demonstrated through external performance criteria, where:**
>
> - **Knowledge is having information about, knowing, understanding, being acquainted with, being aware of, having experience of, or being familiar with something, someone, or how to do something**
> - **Skill is the ability to use one's knowledge effectively**
> - **Attitude is a mental or emotional approach to something, or someone**

For a knowledge, skill or attitude to be generic or transferrable it must manifest itself in several ways. However, the nature of a competency is rarely evident from observed behavior. The two are not equivalent and there is rarely a one-to-one correspondence between them. For example, the ability to understand mathematical concepts may underlie the ability to balance a checkbook, but being able to balance a checkbook does not necessarily mean that one understands anything more elaborate than addition and subtraction.

Therefore, to define competencies as lists of specific repeated skills, tasks and actions is to confuse outcomes with the processes that enable them to occur.

The notion that a competency is causally related to effective performance means that the development of a competency should result in increased effectiveness; in other words competence precedes performance. However, it is possible to observe a skill that correlates with effective performance but which does not necessarily cause that performance. For example, competent writers tend to have more complete vocabularies than other professionals; this results in the finding that verbal achievement test scores are correlated with writing ability. Yet a student who studies the dictionary may receive higher verbal achievement test scores, but will not necessarily be a better writer.

Finally, we must consider the question of what is effective performance. Effectiveness can be defined by its relation to external performance criteria. This means, in part, that it is not sufficient that the individual be pleased with his or her own behavior, but others must also consider it to be effective. The question is really one of defining appropriate criteria. Factors related to job performance, such as satisfying a reference request, or publishing research, or factors related to life, such as happiness or freedom from debt, are criteria worthy of consideration. The competencies that are identified and measured are only as useful as the performance criteria to which they lead. Thus if one's primary goal is to succeed in college, the competencies that are emphasized should be those that are causally related to getting good grades, etc.; whereas if the goal is to become an effective librarian or information professional, then one must seek external criteria that transcend aspects of college success.

COMPETENCY IDENTIFICATION

Earlier we mentioned that competence is commonly determined by a person's being able to perform a given task, and that task performance provides an indication of the required competencies but does not identify competencies directly. Consequently, job task analysis methods have been used to identify the requirements of different jobs, and these job requirements have served as the criteria for inferring knowledge, skills or other characteristics that "cause" job performance. In spite of the fact that such an approach can aid us in our search for relevant competencies, it focuses on the job function as the determinant of competency, rather than on the person who performs the whole job well. This prevents us from looking at certain competencies that are related to effectiveness. For example, as Klemp explains:

> "Consider the job of gas station attendant. The tasks performed in this job include pumping gas, checking fluid levels, making minor repairs and changing money. The competencies that relate to these tasks include manual dexterity, general knowledge about automobile maintenance, and basic mathematical ability. Yet, if you ask the owner or customer of the gas station what makes the difference between an attendant who does the job well and one who should be fired he or she will probably mention characteristics such as honesty, friendliness, reliability, and the ability to service several customers without delay. The competencies that underlie such observable aspects are very different from, and more complex than, the competencies that relate to the functions of a job; yet it is these competencies that must be identified, taught and assessed if they are to be tied to broader life and work/career outcomes. Possession of task-related competencies is important for meeting minimal performance standards but is not, by itself, sufficient for overall effectiveness."
> [Klemp in Pottinger and Goldsmith, 1979]

Many of the studies of librarian and information professional competencies referred to in Appendix 1 were based on task analyses. Rather than replicate the work that had already been completed in identifying task-related competencies, this project was aimed at building upon and complementing the results of those studies. To this end, a three-pronged approach to competency identification was selected by the Project Team and

Advisory Group. The first part of the approach involved gathering information on the activities performed by librarians and information professionals in a variety of different working environments. This information was then used to identify and confirm the traditional task-oriented competencies.

The second part of our competency identification approach involved the more elusive competencies that are not identifiable through task or job analysis. The technique that was selected was developed in the early 1970s by Harvard psychologist, David McClelland, to distinguish the "water walkers" from mediocre performers. The "competence assessment" techniques of McClelland are based on his research on power and achievement motives. Using various personality tests he identified a pattern of attitudes and habits associated with high achievers. To determine the critical differences between the high achievers and mediocre performers, McClelland [1973] and his colleagues developed an intensive interviewing technique which was designed to elicit the information that would otherwise be derived from actual observation of performance on the job. First of all, high achievers were identified by nomination of personnel directors and senior managers. At the same time the mediocre performers (those who performed their jobs just well enough to avoid being fired) were nominated by the same senior personnel. Each of the fifty nominated individuals was then interviewed in depth about certain critical incidents in which they had performed their work well and those in which they had not done well. For each incident, very detailed questions were asked: when did this occur, on which date, where were you, who else was there, what did you do, what did you say, and so on. Once the interviews had been completed, McClelland and his colleagues analysed them to determine which competencies had been displayed by the high achievers but not by the mediocre ones. Note that the interviews were not analysed according to the successful incidents and unsuccessful incidents, but by the competencies demonstrated or exhibited by those who were considered to be the high achievers. McClelland and his colleagues were able to isolate a distinct set of competencies to distinguish between the high and the low achievers.

McClelland and his associates validated the competencies they had identified as valid predictors of superior performance by testing them on a different set of outstanding and mediocre performers from the same organization. Using various psychological tests, the better performers were consistently found to respond in the same way as the high achievers in the original interviews, and much more frequently than did the average performers.

This approach to identifying the competencies required for superior performance was a radical break from traditional competency identification techniques, which were based on expert panel determination of needed competencies. The critical-incident interview technique was developed by John Flanagan during World War II and is used, together with other kinds of job analysis, by a number of companies that design selection and training programs.

The competency identification method we used in this project brought together the task analysis and critical incident techniques. Early in the project the Advisory Committee strongly recommended to the Project Team that the outcome of the project should be a set of competencies necessary for outstanding performance rather than those required merely for minimum or adequate performance of librarians and information professionals. The Advisory Committee and Project Team reviewed the different approaches to competency identification that had been elicited from the literature review, and that were presented and discussed by the two competency experts on the Advisory Committee (Dr. Kobe and Dr. Lea). After careful consideration of the various methods available, their advantages and disadvantages, and the constraints of time, budget and OMB clearance requirements (for surveys conducted under federal contracts), a composite competency identification method was agreed upon as the most appropriate solution.

The composite method involved using McClelland's critical incident technique to interview high achievers in the librarian and information profession, eliciting descriptions of tasks or activities performed by them, and reviewing the results of previously completed and ongoing studies of librarian and information professional competencies. Furthermore, it was agreed that since the information profession is in flux at this time the identification process should be forward-looking and identify those competencies that will be required by librarians and information professionals, rather than those that have traditionally been considered essential for successful performance.

The competency identification process used in this project, therefore, began with the identification of organizations employing librarians and information professionals which were using state- of-the art techniques and systems for handling information and providing information services and products. Nominations for such advanced oganizations were made by members of the Advisory Committee, by the King Research Project Team members, and were solicited from professional societies and opinion leaders in the field. The list of organizations nominated is displayed in Figure 10. Organizations to be visited were selected from this list to ensure equitable representation of different types of organizations, different sizes of organizations, both urban and rural locations, and different geographic regions of the country. A total of 43 organizations were visited. However, many of the organizations agreed to the visits and the interviews only on the contingency that their participation remain confidential.

The visits to these advanced organizations began with an interview conducted with the director/manager/supervisor of the information organization/division/unit. This initial interview served to provide us with an orientation to the organization and the role of the librarians and information professionals within it. The information gathered at this "first-level" interview included the information-related functions performed by or managed by the librarians and information professionals, the number of personnel employed to perform or manage those functions, perceived trends affecting information-related activities, hiring practices, and professional development opportunities for librarians and information professionals within the organization.

Figure 10

NOMINATIONS FOR ORGANIZATIONS TO BE INCLUDED IN THE COMPETENCY IDENTIFICATION ACTIVITY

Aluminum Association Library, Washington, D.C.

American Bankers Association Library, Washington, D.C.

American Chemical Society, Washington, D.C.

American National Standards Institute, Committee Z-39, Gaithersburg, MD

Amtrack, Washington, D.C.

Arent, Fox, Kintner, Plotkin & Kahn, Washington, D.C.

Arnold & Porter, Washington, D.C.

Art Gallery, The, University of Maryland, College Park, MD

Aspen Systems Corporation, Rockville, MD

Aurora Public Library, Aurora, CO

Avatar Systems, Inc., Potomac, MD

Baker and Taylor Corporation, Somerville, NJ

Baltimore City Jail Library, Baltimore, MD

Baltimore County Public Library, Baltimore, MD

Baltimore County Public Library, North Point Branch, Baltimore, MD area

Baltimore County Public Library, Towson Area Branch, Towson, MD

Baltimore Regional Information Center (BRIRC), Baltimore, MD

Bell Laboratories, Libraries & Information Systems Center, Murray Hill, NJ

Berul Associates, Ltd., Rockville, MD

Best Programs, Alexandria, VA

Boeing Computer Services Company, Vienna, VA

Bureau of National Affairs, Washington, D.C.

Capital Children's Museum, Washington, D.C.

Capital Systems, Rockville, MD

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Figure 10 (Continued)

Chemical Propulsion Information Agency, Johns Hopkins University Applied Physics Laboratory, Columbia, MD

City of Alexandria Records Center, Alexandria, VA

Columbus-Franklin County Public Library, Columbus, OH

Congressional Information Service, Bethesda, MD

Congressional Research Service, Washington, D.C.

Continental Telephone, Manassas, VA

Cooperating Libraries of Central Maryland, Baltimore, MD area

Costabile Associates, Bethesda, Maryland

Darien High School, Darien, CT

Decatur, Stephen, High School, Worcester County, MD

Defense Technical Information Center, Alexandria, VA

Department of Justice Library, Washington, D.C.

Disclosure, Inc., Bethesda, MD

E.I. Dupont de Nemours & Company, Central Information Services Division, Wilmington, DE

Engineering Information, Inc., New York, NY

Enoch Pratt Free Library, Baltimore, MD

ERIC Processing and Reference Facility, Bethesda, MD

FMC Corporation, Technical Information Services, Princeton, NJ

Fairfax County Public Library, Fairfax, VA

Faxon Company, The Federal Information Systems & Services Group, Vienna, VA

Flower Valley Elementary School, Montgomery County, MD

General Accounting Office, Washington, D.C.

General Electric, Gaithersburg, MD

Georgetown University Medical Library, Washington, D.C.

Government Printing Office, Washington, D.C.

Figure 10 (Continued)

Greensboro Elementary School, Caroline County, MD

Hammond Middle School, Howard County, MD

Harford County Public Library, Bel Air, MD

Hickory Elementary School, MD

Holy Cross Hospital, Silver Spring, MD

Howard University Library, Washington, D.C.

IBM Corporation, White Plains, NJ

INF Guild, Lexington, MA

Informatics, Rockville, MD

Information Clearing House, Inc., New York, NY

Information Handling Services, Rosslyn, VA

Infosource, Inc., Pittsburgh, PA

Interactive Television, Arlington, VA

International City Management Association, Washington, D.C.

International Data Corporation, Waltham, MA

Iowa State University Library, Ames, IA

J. Walter Thompson Agency, Information Center, Chicago, IL

Janesville Public Library, Janesville, WI

Johns Hopkins University Library, Baltimore, MD

Joint Bank Fund Library, Washington, D.C.

Journal of Commerce, The, New York, NY

King Research, Inc., Rockville, MD

Library of Congress - Associate Librarian for National Programs, Washington, D.C.

Library of Congress, Division of Services for the Blind & Physically Handicapped, Washington, D.C.

Library of Congress, Washington, D.C.

Figure 10 (Continued)

Library Video Network, Woodlawn, MD

Lister Hill Center, National Library of Medicine, Bethesda, MD

Los Angeles County Law Library, Los Angeles, CA

Los Angeles Times Editorial Library, Los Angeles, CA

Marriott Corporation, Bethesda, MD

Maxima Corporation, The, Bethesda, MD

Memphis-Shelby County Public Library, Memphis, TN

Merck and Co., Inc., Rahway, NJ

Metropolitan Washington Library Council, Washington, D.C.

Miller and Chevalier Law Library, Washington, D.C.

Montgomery Blair High School, Silver Spring, MD

Montgomery County Public Library, Rockville, MD

NABU, Alexandria, VA

NASA STIF, Baltimore, MD

NOAA Library, Rockville, MD

National Air & Space Museum, Office of Records Management, Washington, D.C.

National Bureau of Standards Library, Gaithersburg, MD

National Bureau of Standards, Standard Reference Data Center, Gaithersburg, MD

National Commission on Libraries and Information Science, Washington, D.C.

National Library of Medicine, Indexing Section, Bethesda, MD

National Library of Medicine, History of Medicine Division, Archives and Manuscripts, Bethesda, MD

National Library of Medicine, History of Medicine Division, Prints and Photographs, Bethesda, MD

National Library of Medicine, Medical Subject Headings Section, Bethesda, MD

National Library of Medicine, MEDLARS Management Section, Bethesda, MD

Figure 10 (Continued)

National Library of Medicine, Office of Inquiries and Publications Management, Bethesda, MD

National Oceanic and Atmospheric Administration, Assessment, & Information Services Center, Washington, D.C.

National Oceanic and Atmospheric Administration, National Environmental Satellite Data and Information, Washington, D.C.

National Portrait Gallery Library, Washington, D.C.

National Press Club, Washington, D.C.

National Rehabilitation Information Center, Washington, D.C.

National Technical Information Service, Springfield, VA

On Line Computer Systems, Inc., Germantown, MD

Phillips Publishing Company, Washington, D.C.

Planning Research Corporation, McLean, VA

Plastics Technical Evaluation Center, U.S. Army Armament Research and Development Command, Dover, NJ

Preston Elementary School, Caroline County, MD

Professional Records Storage, Washington, D.C.

Public Service Satellite Corporation, Washington, D.C.

Rob McGee Associates, Annapolis, MD

Rockford Public Library, Rockford, IL

St. Mary's County Public Schools, St. Mary's County, MD

St. Paul Public Library, St. Paul, MN

San Mateo School System, San Mateo, CA

Shaker Heights Public Schools, Shaker Heights, OH

Shock and Vibration Information Center, Naval Research Laboratory Washington, D.C.

Smithsonian Institution, Information Resources Management Office, Washington, D.C.

State Services Organization Library, Washington, D.C.

Figure 10 (Continued)

Software AG, Reston, VA

Source, The, McLean, VA

Southern Middle School, MD

Springbrook High School, Silver Spring, MD

Squire, Sanders & Dempsey, Washington, D.C.

Stamford Public Schools, Stamford, CT

Suburban Library System, Hinsdale, IL

Surgen Business Archives, Gaithersburg, MD

Tax Analysts, McLean, VA

Thunderhill Elementary School, Howard County, MD

Turner Subscription Agency, New York, NY

U.S. State Department Library, Washington, D.C.

University of Illinois - Chicago Circle Library, Chicago, IL

University of Wisconsin at Parkside Library, Racine, WI

Washington Hospital Center, Washington, D.C.

Washington Post, Washington, D.C.

Washington Researchers, Washington, D.C.

Waugh Chapel Elementary School, MD

Waukegan Public Library, Waukegan, IL

Williams, Phyllis E., High School, Prince George's County, MD

Wilmer, Cutler & Pickering, Washington, D.C.

Wright, C. Milton, Middle School, Harford County, MD

At the end of the interviews the directors/managers/supervisors were asked to nominate their outstanding librarians and information professionals for more detailed interviews with us. In addition to nominating candidate professionals, they were asked for the reasons behind their nominations. Thus, our method of identification of superior performers was identical to that used by McClelland. In those organizations with only one or two librarians or information professionals the director/supervisor/manager was also a candidate for the more detailed interview.

Each of the outstanding performers was interviewed in a "second-level" detailed interview. These interviews were conducted in two phases. The first phase involved gathering details concerning the librarians and information professionals and their work, tasks and activities. The second phase involved in-depth probing about three critical incidents of exemplary work. You may recall that McClelland and his associates probed for three positive, successful incidents and three negative ones. This issue of how many of which type of incident to discuss was addressed by the Advisory Committee. In order to determine the effectiveness and actual use of the critical incident technique, the Advisory Committee and Project Team witnessed a live demonstration in which one of the Advisory Committee members was interviewed. The demonstration involved two positive incidents and one negative incident. The determination of competencies from the interview responses was demonstrated. It soon became evident that discussing negative incidents is extremely difficult and often unpleasant for the interviewee, resulting in fewer details being elicited. Having witnessed our courageous volunteer struggle with a public examination of an unsuccessful episode, the Advisory Committee and Project Team agreed not to request negative incidents of the interviewees. Thus our primary means for identifying librarian and information professional competencies was the critical incident interview technique.

Librarian and information professional competencies were also identified from the information gathered during the first-level interview and the non-critical incident portion of the second-level interview. In both instances, the tasks and activities performed by librarians and information professionals were described. This information was later merged with task and activity information produced during relevant task and job analysis studies and competencies derived from them.

In summary, the three-way approach to competency identification involved:

- critical incident interviews with outstanding performers
- interviews concerning librarian and information professional tasks and activities with directors/managers/ supervisors of information organizations/divisions/units and with outstanding performers
- reviews of the results of relevant related studies and projects to identify librarian and information professional competencies.

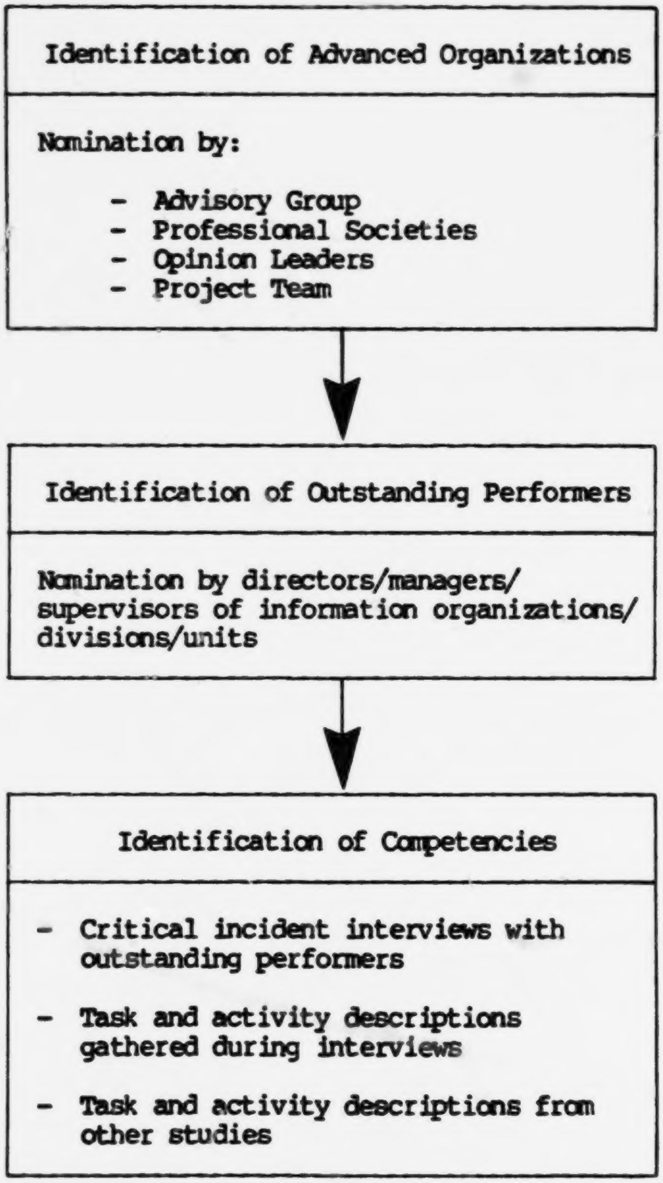
The process we used and the methods used are shown graphically in Figure 11.

The two levels of interview we conducted are described in more detail below.

The first level interview began by asking the respondents to describe their organizations in general and the information activities conducted within them. In discussing information-related functions performed within an organization, or by one of its constituent units, care was taken to allow the interviewees to describe the functions performed in their own terms. The functions were recorded in those terms together with definitions as appropriate. The interviewers also prompted and asked whether or not certain functions were performed if they thought any of them may have been overlooked. The purpose of this first segment of the interview was to thoroughly familiarize the interviewer with the organization and the role of librarians and information professionals within it.

Figure 11

STEPS IN THE IDENTIFICATION OF LIBRARIAN AND OTHER INFORMATION PROFESSIONAL COMPETENCIES



Identification of Advanced Organizations

Nomination by:

- Advisory Group
- Professional Societies
- Opinion Leaders
- Project Team

Identification of Outstanding Performers

Nomination by directors/managers/supervisors of information organizations/divisions/units

Identification of Competencies

- Critical incident interviews with outstanding performers
- Task and activity descriptions gathered during interviews
- Task and activity descriptions from other studies

The second part of the interview was concerned with librarians and information professionals within the organization. The number of professional vs. paraprofessional vs. clerical staff employed to perform information-related functions was recorded together with their distribution across functions. Professionals were identified as senior, mid or entry level (with senior having 10 or more years of professional experience; mid having 4-9 years; and entry having 1-3 years). Interviewees were asked whether the distribution of staff across and within functions had remained relatively stable over the last five years, or whether there had been changes in either the numbers or types of staff allocated to the various functions. The educational (graduate and undergraduate) backgrounds of the professional staff performing the various functions were identified in terms of subject area and degree(s) earned.

The third segment of the interview focused on key prevailing trends and their effect on the information activities of an organization. In particular we were concerned with how the information-related functions might change in the future, whether there would be any affect on personnel requirements, and an indication of how well prepared the existing librarians and information professionals would be to cope with any changes resulting from the trends. The directors/managers/supervisors were then asked which competencies, in terms of knowledge, skills and attitudes, are needed by and/are desirable for the librarians and information professionals to perform each function within the information unit or division. The perceived effect of the major trends on those competency needs and requirements was also discussed.

The final set of discussion topics were concerned with hiring practices and professional development support for librarians and information professionals within the organizations. We wanted to identify how different organizations set about finding, selecting and hiring librarians and information professionals, what methods were used, what criteria were specified, and whether there were any differences in procedures for hiring professionals to perform different functions. Further, we were particularly interested in finding out whether any specific competencies (knowledge, skills and attitudes) were especially difficult to find.

Related to this question was the question of how well prepared librarians and information professionals were upon entering the organizations to perform their designated functions. If the librarians and information professionals were not sufficiently prepared for their jobs we asked how they were lacking, how they were prepared for their work, and how long the process took to bring them to the point where they could perform their work functions adequately. Interviewees were asked whether or not the organization supported professional development activities and how. For example some organizations include professional society memberships in a benefit package, others give employees the time to attend courses and seminars related to work activities or pay the course fees, etc. Other ways of supporting professional development, such as regular meetings to discuss work-related problems and solutions, or the availability and circulation of professional literature, were also discussed. Career paths and opportunities for librarians and information professionals within the organizations were discussed together with criteria and procedures used to evaluate, promote and reward librarians and information professionals. Finally respondents were asked to nominate individual librarians and information professionals with above average performance in their work so that we could conduct the more detailed, second-level interviews with them.

The main purpose of the first-level interview was to make initial contact with the organization and, to obtain nominations of superior performers for the competency identification process. However, we felt that it was important to obtain an understanding of the environments within which librarians and information professionals work: do they work alone, or in groups? what functions do they perform within an organization? how are they treated? what is expected of them in terms of performance? how are they evaluated? what opportunities are open to them? etc.

The second-level interview began with details of the respondent's position within the organization, job title, the work that he or she performed, educational background, and information work experience (including the names of organizations worked for, position(s) held and the number of years spent in each position).

The interview then moved to some of the topics previously discussed in the first-level interview. The librarians and information professionals were asked how they kept up with their field in general, and how they expanded and updated their technical knowledge and skills. They were asked about major trends prevailing, how their work functions might change as a result of those trends, and how well prepared they felt to cope with those changes.

After answering these introductory questions the interviewees were relaxed and willing to discuss their work. At this stage we moved into the critical incident phase of the interview. Each respondent was given a brief description of the process and the reason for using it, and asked to take a few minutes to decide on three incidents to discuss. They were asked to select three incidents occurring in their current position which had resulted in a successful outcome and which were considered to be examples of above average performance by others. These were incidents that would stand out in their minds as exceptional events.

Once three incidents had been selected by the interviewees they were asked to start describing the first incident. The interviewer then asked probing questions to elicit the detail of what happened, who was there, what was done, why, when, how, what happened next, why was the incident successful, how did they know the incident was successful, and so on. This phase of the interview was open-ended and lasted up to several hours. The key to the successful conduct and completion of the critical incident interview is the skill (or, more accurately, the competency) of the interviewer in drawing out more information about an incident without imposing any of his or her own ideas or biases. Thus the interviews were conducted only by trained senior professionals who, when possible, both attended each interview. The interviews (at both levels) were all tape-recorded so that the interviewers were not hampered by the need to take extensive notes.

Once three incidents had been described in detail, the interview moved into its third and final phase. As with the second phase, we repeated some of the questions that had been posed in the first level interview, but which we did not want to ask before the critical incident portion for fear of biasing the critical incident description. These included asking the interviewee to think of any knowledge, skills, or attitudes that are needed for their work, how well prepared they had been on entering their current organization to perform their designated function, what they were lacking, how they prepared themselves to perform their designated function, and how long it took. They were asked about professional development programs and activities they had participated in, both within their organization and outside it, and about career paths and opportunities open to them.

After the interviews had been completed the tapes were transcribed and reviewed by the Project Team. The transcriptions and the tape recordings themselves were analyzed extensively and repeatedly to identify competencies (knowledge, skills and attitudes) exhibited by and tasks or activities performed by those interviewed. The competencies thus identified were merged with competencies identified through secondary sources (previous studies, etc.) and formed the basis for the listings developed for validation purposes.

COMPETENCY VALIDATION

Validation was defined in the RFP as "the confirmation that the teaching of a specific competency will result in the acquisition of the associated skills". A competency can, therefore, be validated by measuring the degree, or extent, of competency attainment as a result of a particular educational process. Measures of competence should have educational validity, i.e., performance should change as a result of the educational programs. Several approaches to competency validation have been developed. The most sophisticated of these is criterion-related validation. This competency validation approach is based on a statistical correlation of performance on a measure of competency attainment with later career performance (criterion) which is presumed to be influenced by or related to the competency being measured. Typically this can be done in two ways.

The first way involves tracking individuals who have been evaluated in terms of the competency measure(s) through their careers, and determining whether those who performed well on the measure(s) are more effective or successful in their jobs than those who performed less well on the same measure(s). Such a procedure, which is known as predictive validation, is extremely time consuming and was certainly not feasible within the constraints of this project.

A second method for achieving criterion-related validation is to determine whether individuals identified as competent or effective in their roles perform better on the measure(s) than their less competent, or less effective, counterparts. This process is known as concurrent validation. This was the method used by McLelland in the example given earlier in this chapter.

Once a measure of competency has been shown to be capable of projecting performance (i.e., measures relating to predictive or concurrent validity) then another form of validation becomes important. This third form is called construct validation and comprises a set of statistical procedures which are used to test the extent of the ability of a measure to measure that competency for which it was designed. This validation approach involves the comparison of competency measures across disciplines (in the case of generic competencies) and the comparison of competency measures across institutional boundaries within the same discipline. In this case the results of a test are compared with the results of other tests for agreement or disagreement.

The two final forms of competency validation are easier to design and implement. They are content validity, which reviews whether a measure adequately covers the domain it is intended to cover, and face validity which considers whether a measure appears to measure what it was intended to measure.

In summary, five approaches to competency validation and justification have been defined. In decreasing order of sophistication they are:

- predictive validation } Criterion-related
- concurrent validation } validation
- construct validation
- content validation
- face validation

In considering the five alternative approaches to competency validation the Advisory Committee and Project Team considered the first three to be too complex and costly to implement within the framework of this project. There was also some concern that since the competency identification process would yield essentially a "first-cut" at identifying the competencies required by a wide range of librarians and information professionals, there would be little to gain by embarking on a sophisticated statistical method of validating a rough-cut set of competencies.

The competency identification techniques used in this study were, as described earlier, the critical incident technique supplemented by the task or activity analysis. Both of these techniques have themselves undergone critical validation processes. The two techniques can be variously considered as competency identification techniques and competency measurement or assessment techniques. The Advisory Committee and Project Team, having eliminated the first three validation approaches, focussed on the content validation and face validation. The method selected to implement the validation exercise was that of peer review, a method extremely common in the validation of librarian and information professional competencies, and of competencies in other fields.

There are many ways to organize peer review of competencies including panel reviews, focus group reviews, independent reviews, etc. The basic method of validation of librarian and information professional competencies selected was to ask relevant professional societies to review the validation packages we had prepared. The Advisory Committee and Project Team felt that there was also an opportunity to involve many librarians and information professionals in the community-at-large by opening up the validation exercise to those who were willing to participate. In addition to several offers to participate in the project from professionals who had read or learned about the project, we published calls for participation in appropriate professional journals. The response to the call was overwhelming and a decision to extend the time period allotted to validation was made by the Project Team and Department of Education personnel. A total of 407 organizations and individuals requested 2,943 competency lists for validation.

The lists of knowledge, skills and activities were organized by function within work setting. Within each function they were organized according to the framework described in Chapter 2. It became clear early on in the project that activities or tasks are intimately related to competencies, and that this relationship could lead to a considerable amount of duplication in our lists. For example, associated with each activity is knowledge of that activity, knowledge of how to perform the activity, and skill in performing the activity. As our activity lists were fairly lengthy it was decided (jointly by the Project Team and Department of Education personnel) that the activities should be extracted as a separate component of the competency lists. Thus, for each function and within each work setting the validation package consisted of a list of knowledge, skills, attitudes and activities identified. Of these, only the knowledge, skills and attitudes were actually fully validated, although validators were invited to comment on, or add to, the activities lists. A full set of activities, organized by professional level, within functions within work setting is provided in Volume 2.

Although the duplication of activities had been minimized within each function, we deliberately made no attempt to reduce redundancy across functions and across work settings. Our rationale behind not doing so was based on the fact that most individuals would generally validate only one function (within one work setting). Thus, in order to manage the paper flow in producing and distributing lists, they were preformatted so that each function within each work setting was a completely self-contained set.

Validators were asked to specify which competencies they were most qualified to validate (by function and work setting) and to consider, for each candidate competency, whether that competency (knowledge, skill or attitude) was essential to successful performance of that function, desirable, or not applicable, and whether the competency would become more, or less, important in the future. Validators were also asked to add competencies or activities that they felt were omitted and to make comments and suggestions. A total of 114 organizations and individuals returned 634 validated competency lists. This represents a response rate of 28 percent for organizations and individuals, and of 23 percent for the listings.

The returned validated competencies were reviewed and the results tabulated. There was no weighting of responses. Each response counted for one point (for example, a mark indicating that a competency was essential was scored as a "1" in the "essential" column). If more than 50 percent of the responses for any single competency were "essential", then that competency was considered essential for that professional level, function and work setting; if more than 50 percent were "desirable" then the competency was considered desirable. Any list that received fewer than 10 validated responses was not considered validated. The generic competencies were identified from the validated sets by considering only those identified from the validated sets, and then by considering only those competenices that were scored "essential" across all the functions or all the work settings for which a sufficient response was received. The results of these analyses are described in the next chapter.

CHAPTER 4

INFORMATION WORKERS AND LIBRARIANS AND INFORMATION PROFESSIONALS

Fritz Machlup was probably the first principal scholar to recognize the rapid emergence of an information industry in the U.S. and its contribution to the national economy [1962]. One of the most important revelations of Machlup's work was the trend observed in the shifting of the work force away from the agricultural sector that prevailed in the 1800's to the industrial work force in the first half of the 20th century to the information work force in existence, from about 1960. This phenomenon led Bell to write his epic book *The Coming of Post-Industrial Society* [1973], in which he characterized this shift from labor-intensive construction and manufacturing industries to service and knowledge industries. What is meant by all this? What are the implications to and for the information profession? First, it is useful to understand what is meant by the information sector of society and then define the scope of the information profession and of library and information science within this sector.

THE INFORMATION COMPONENT OF THE WORKFORCE

The work force of major industrial nations can be categorized into four basic sectors: argicultural, manufacturing, services and information.* The changes in these four sectors from 1860 to 1980 are shown in Figure 12. The three stages in the figure represent the agricultural, industrial, and information ages. This picture shows a sharp decline in proportion of workers involved in the agricultural sector. Several factors probably led to this decline, including new technology (farm machinery), soil conservation, fertilizers and management techniques. Obviously, the decline in proportion of work force was not accompanied with a decline in output, since the U.S. is certainly a leading producer of farm products in the world. Not the least important reason for the increased productivity (measured in terms of manpower) in the agricultural sector was the intelligent use of information by the agricultural community. The agricultural

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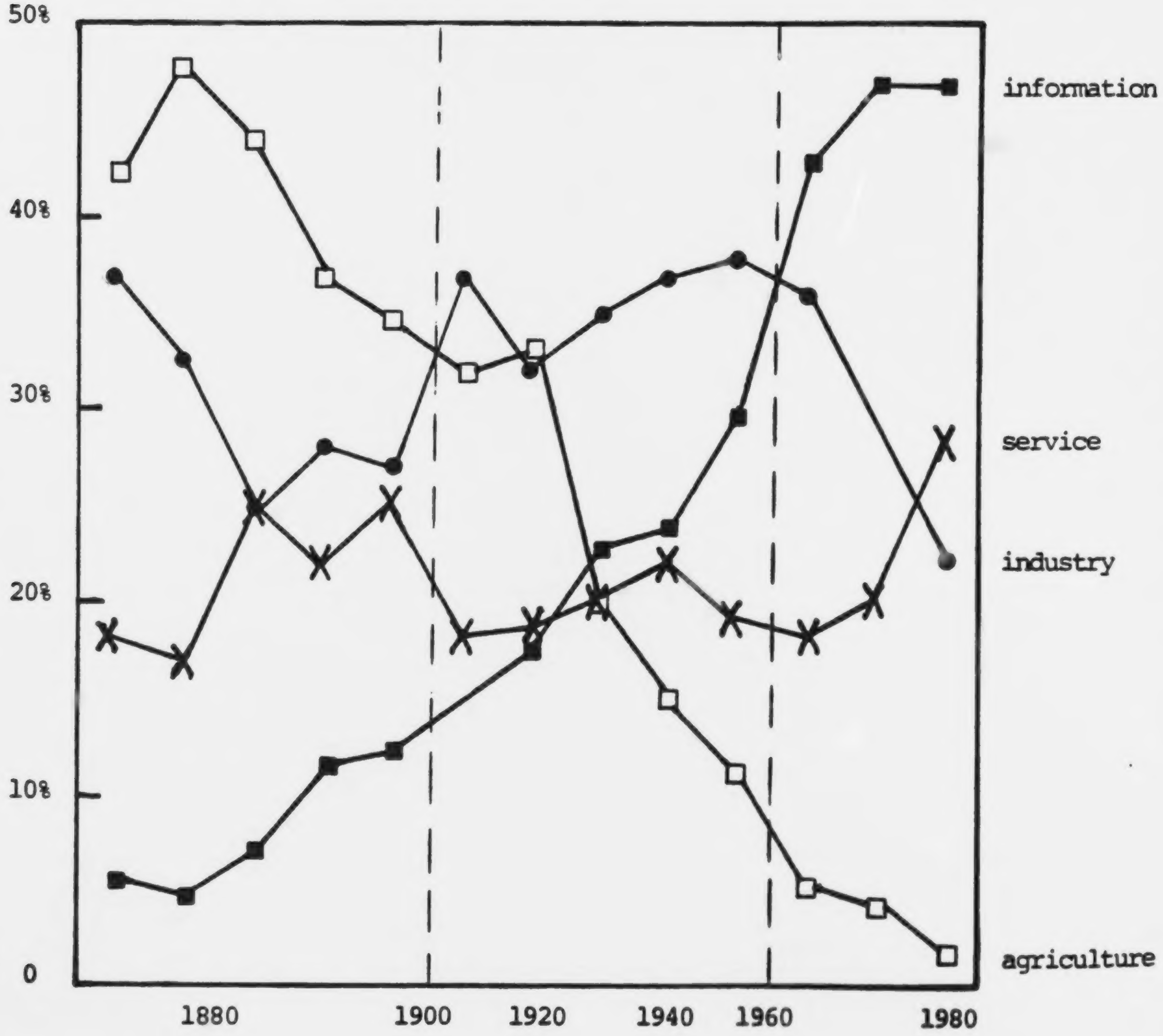
* These four sectors are sometimes called primary, secondary, tertiary and quaternary industries respectively.

FIGURE 12

FOUR SECTOR AGGREGATION OF THE U.S. WORK FORCE BY PERCENT (1860 - 1980) USING MEDIAN ESTIMATES OF INFORMATION WORKERS



information programs, led by county extension agents, still stand as a landmark example of diffusion of information at its best.

The manufacturing sector remained relatively constant over the years from 1860 to the post-World War II years. In fact it probably was sustained by that event. In terms of proportion of the work force the manufacturing sector reached its peak in the early 1900s and remained stable until about 1950, at which time it began to decline. Most of the people involved in this sector worked in construction or manufacturing companies. The service sector which includes workers in stores, hotels, restaurants, etc., has remained relatively constant over the years at about 18 percent of the work force in 1860 with about the same level in 1970, although it seems to have increased between 1970 and 1980.

The information sector has shown the greatest growth in the relative proportion of workers engaged in information related activities. It started at about eight percent of the work force in 1860 and has grown to over 40 percent in 1980, assuming the highest proportion of the four sectors in 1960. The relative growth of the information sector since 1950 is given by several sources (Machlup, Porat, Rubin and Sapp, and Bell) in Table 1. Bell shows a distinct flattening of the proportion of the work force in the information sector from 1970 to 1980. Rubin [1984], also shows only a two percent increase from 1970 to 1980 (39% to 41% using new methods or 41% to 43% using comparable old methods). The decline of relative growth is largely attributable to the educational field, where a distinct drop in relative employment is observed. It is emphasized, however, that the absolute growth in the information sector is continuing. Using Rubin's figures, the growth in the information sector is from 34 million workers involved in information related work in 1970 to 46 million workers in 1980.

TABLE 1

ESTIMATES OF THE PROPORTION OF THE U.S. LABOR WORK FORCE IN THE INFORMATION AND KNOWLEDGE SECTOR

Source	Year 1950 (%)	1959 (%)	1960 (%)	1967 (%)	1970 (%)	1980 (%)
Machlup	28.3	31.6				
Porat			45.0			
Rubin & Sapp	30.7		34.7		41.0	
Bell	30.8				46.4	46.6

SOURCE: Lane [1983] in Cronin ["Post-Industrial Society", 1983].

Many industrial nations have experienced similar growth (see Figure 13). The Organization for Economic Cooperation and Development (OECD) in 1978 and 1979 measured the proportion of the work force engaged in information related activities with results as follows:

		Proportion (%)
Austria	(1976)	32.2
Canada	(1971)	39.9
Finland	(1975)	27.5
France	(1975)	32.1
Japan	(1975)	29.6
Sweden	(1975)	34.9
United Kingdom	(1975)	35.6
United States	(1970)	41.1
West Germany	(1978)	33.2

The OECD study has the advantage of using common definitions and assumptions, based largely on those developed by Porat and Rubin.

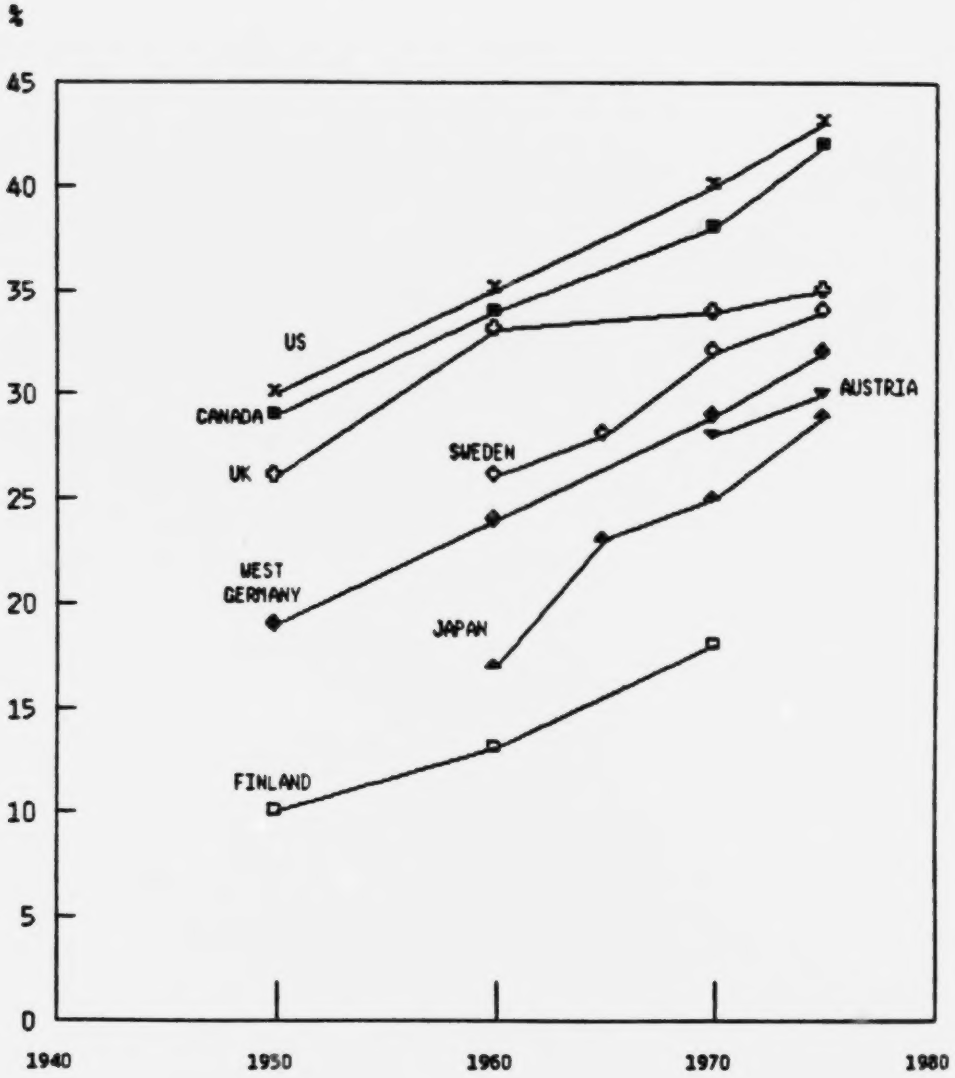


Figure 13. Information Occupations as a Percentage of Economically Active Nations
Source: Sweeney

The number of people in the four basic sectors is counted by taking data from the decennial census and data from the Bureau of Labor Statistics. Nearly 200 occupations were used to count the number of information workers. These information related occupations can be grouped into four basic categories [Porat]:

1) Information Producers; such as scientists, engineers, market research and coordination, and information gatherers.

2) Information Processors; such as administrative and managerial workers, supervisory personnel and clerical staff.

3) Information Distributors; such as educators, public information disseminators (i.e., librarians, archivists, etc.), and communication workers.

4) Information Infrastructure; such as machine workers, postal workers and persons involved in telecommunications.

This method of categorizing information workers is useful because it classifies the workers by how their work relates to information.

One must be careful interpreting data gathered and analyzed in the way Porat, Rubin and others have done as there is a degree of arbitrariness in the ways in which they classified workers. Although this classification generally includes only workers whose principal activity involves producing, processing or distributing information, it also includes workers who are only remotely engaged in information related activities. For example, it includes construction workers who work on the construction of buildings that house information workers, such as schools or computer firms.

There are other ways in which the work force can be subdivided. For example, Masuda categorizes information workers into those employed in information industries, knowledge industries, arts industries and ethics industries as shown in Figure 14. This classification first sub-divides information industries by type of information and then by the way in which these industries handle or process information. The problem with Masuda's classification is that his categories are not mutually exclusive.

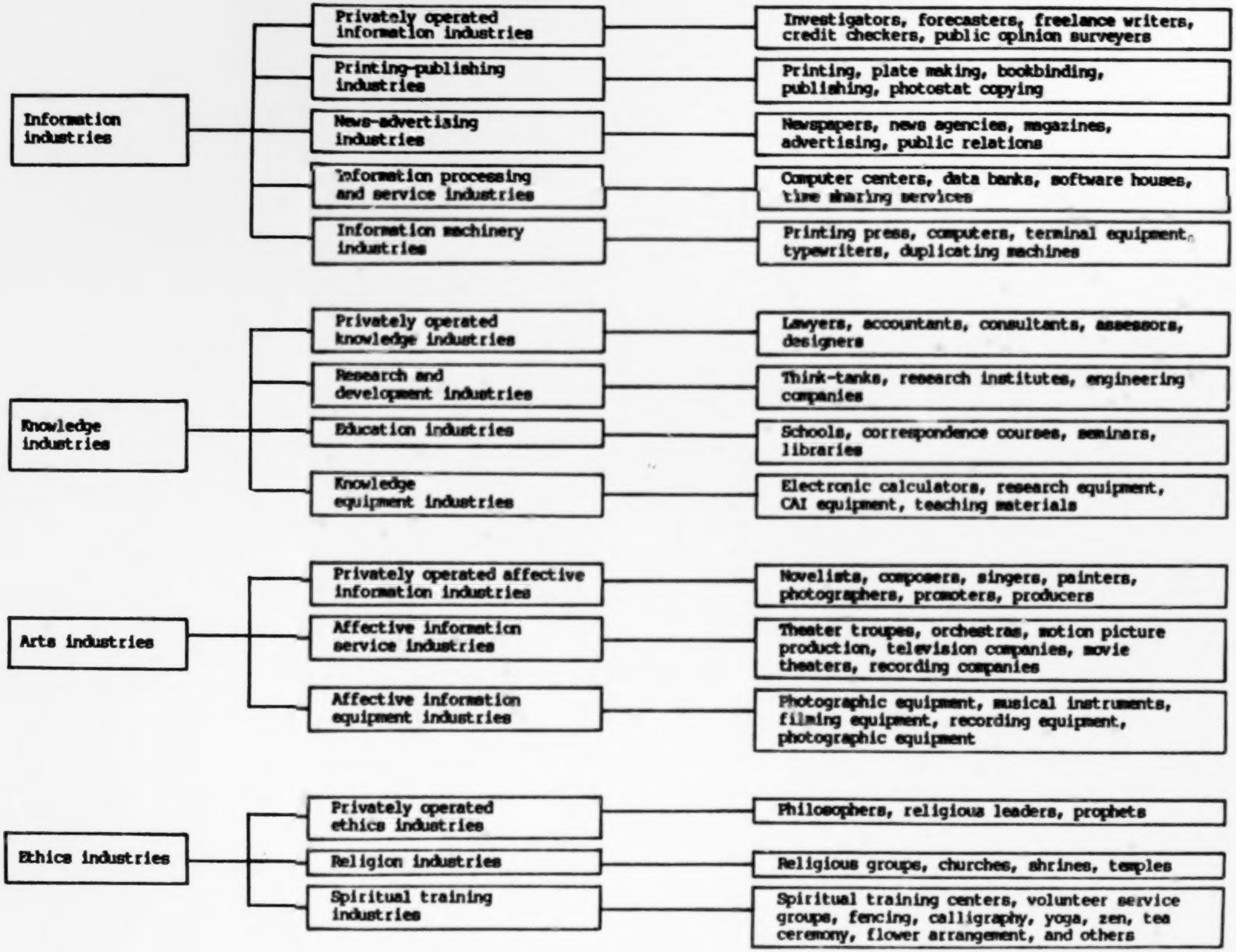

Information industries
Privately operated information industries
Investigators, forecasters, freelance writers, credit checkers, public opinion surveyers
Printing-publishing industries
Printing, plate making, bookbinding, publishing, photostat copying
News-advertising industries
Newspapers, news agencies, magazines, advertising, public relations
Information processing and service industries
Computer centers, data banks, software houses, time sharing services
Information machinery industries
Printing press, computers, terminal equipment, typewriters, duplicating machines
Knowledge industries
Privately operated knowledge industries
Lawyers, accountants, consultants, assessors, designers
Research and development industries
Think-tanks, research institutes, engineering companies
Education industries
Schools, correspondence courses, seminars, libraries
Knowledge equipment industries
Electronic calculators, research equipment, CAI equipment, teaching materials
Arts industries
Privately operated affective information industries
Novelists, composers, singers, painters, photographers, promoters, producers
Affective information service industries
Theater troupes, orchestras, motion picture production, television companies, movie theaters, recording companies
Affective information equipment industries
Photographic equipment, musical instruments, filming equipment, recording equipment, photographic equipment
Ethics industries
Privately operated ethics industries
Philosophers, religious leaders, prophets
Religion industries
Religious groups, churches, shrines, temples
Spiritual training industries
Spiritual training centers, volunteer service groups, fencing, calligraphy, yoga, zen, tea ceremony, flower arrangement, and others

Figure 14. The Quaternary Industries

Another way to distinguish the information sector from the other sectors is to include only those whose principal work activity involves creating, communicating, processing or using information. These workers would include many office workers, postal workers, tradesmen and most professionals. It is the professional level of information work we are concerned with in this project, particularly those professionals who deal with information on behalf of others. The professional component of the information community is discussed below.

LIBRARIANS AND INFORMATION PROFESSIONALS

We have found it useful to categorize professionals into groups by the information-related functions they perform. This basis for categorization is used partially because it helps distinguish those who create and use information from those who process information on behalf of others. However, the primary reason that this categorization is used in this project is because education involves the development of competencies (knowledge, skills, and attitudes) and competencies required in the work-place vary by the functions that librarians and information professionals perform. Obviously, other ways of categorizing the information work force or profession for other contexts or purposes make sense as well. However, we feel that the functional means of categorization is the best way for the purposes of identifying and describing librarian and information professional competencies.

In order to categorize librarians and information professionals, we refer to the eleven generic functions defined in Chapter 2 and shown in Figure 9.[*] Examples of librarians and information professionals who perform these functions are given in Figure 15. There are three groups of these librarians and information professionals, only one group of which we are concerned about in this report. The first group involves librarians

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[*] These 11 generic functions include creation and origination, communication, assimilation and use, correlation and formatting, transformation, recordation, reproduction, storage, organization and control, identification and location, and access.

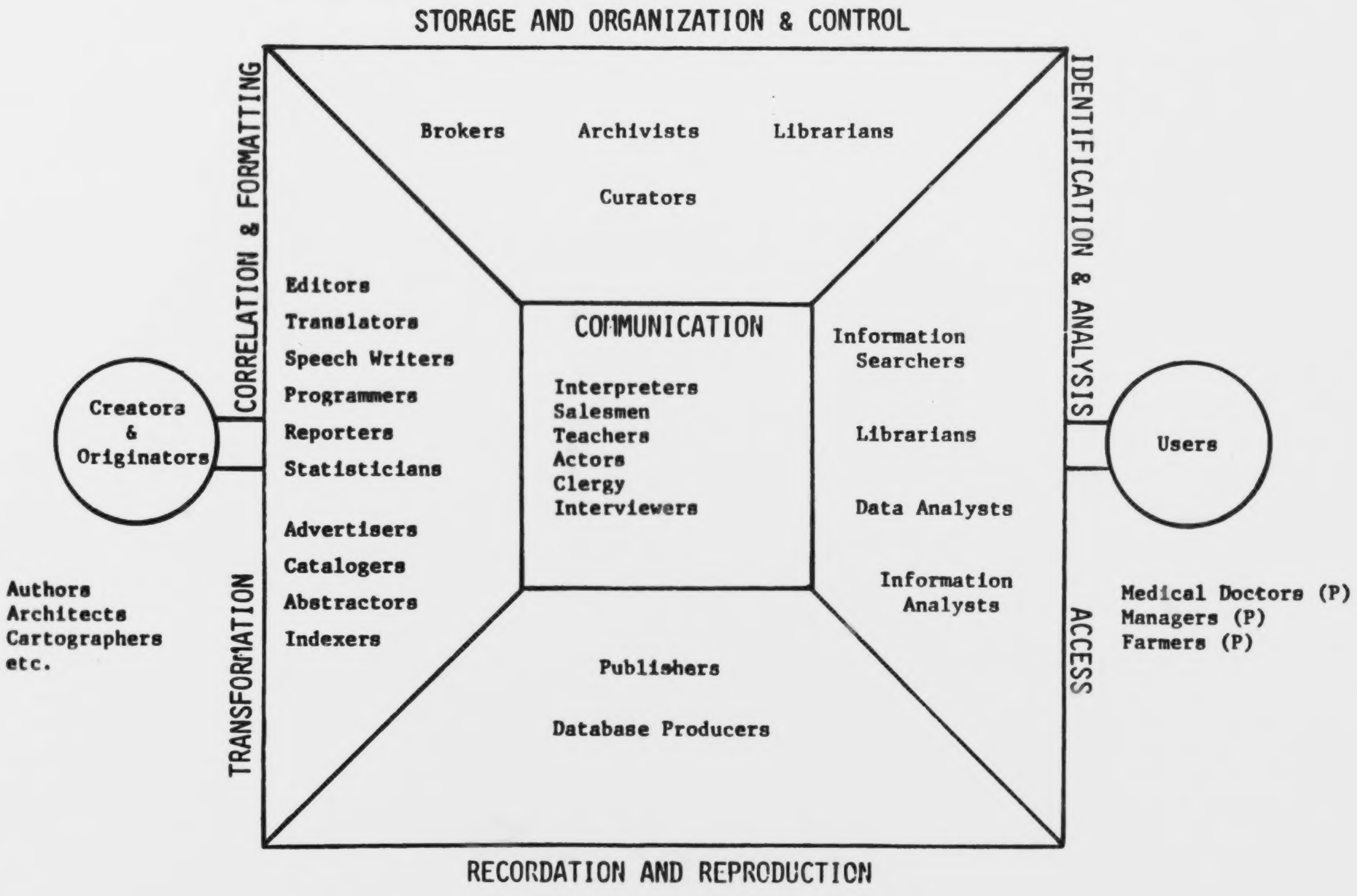
STORAGE AND ORGANIZATION & CONTROL
Brokers
Archivists
Librarians
Curators
CORRELATION & FORMATTING
IDENTIFICATION & ANALYSIS
Editors
Translators
Speech Writers
Programmers
Reporters
Statisticians
Advertisers
Catalogers
Abstractors
Indexers
COMMUNICATION
Interpreters
Salesmen
Teachers
Actors
Clergy
Interviewers
Information Searchers
Librarians
Data Analysts
Information Analysts
Creators & Originators
Users
Authors
Architects
Cartographers
etc.
Medical Doctors (P)
Managers (P)
Farmers (P)
TRANSFORMATION
ACCESS
Publishers
Database Producers
RECORDATION AND REPRODUCTION

Figure 15. Librarians and Other Information Professionals

and information professionals who are primarily engaged in creation and origination (e.g., authors, scientists, architects, etc.), communication (e.g., teachers, salesmen, clergy, etc.), and end-user of information (e.g., medical doctors, managers, farmers, etc.).

The second group involves professionals who directly serve the creators and originators of information. Some of these professionals deal principally with transformation or correlation and formatting of information. Librarians and information professionals who are largely involved in transformation of primary information include translators, reporters, advertisers, graphic arts professionals, etc. Those involved in correlation and formatting primary information are editors, technical writers, speech writers, etc.

The remaining librarians and information professionals are concerned with recordation, reproduction, storage, organization and control, identification and location, some analysis of, and access to information. Cronin ["Post-Industrial Society", 1983], in an analysis of manpower issues for the library and information profession, indicates that it is difficult to determine which librarians and information professionals the traditional library and information science schools should potentially be concerned with. It is our contention that the dividing line should be those professionals who are involved in processing recorded information on behalf of others. This includes all those functions above except creation and origination, communication, and assimilation and end-use.

In an information manpower study performed by the University of Pittsburgh and King Research in 1980, we also attempted to sub-divide the information profession into the functions that are performed in information transfer. The functions were grouped into those functions that are involved in (1) information operations or practice, (2) the management of information units, (3) information research or technology, or (4) education and training of librarians and information professionals and workers. All of the eight information processing functions that we have discussed above are actually in the information operations or practice and management categories used in the University of Pittsburgh study. We will discuss the other two categories later.

In the information manpower survey, one operational function involved "preparing data and information for use by others." This function corresponds to the two generic functions; transformation, and correlation and formatting. In the survey we did not make a distinction between those professionals who are involved with primary information (e.g., technical writers, editors, translators) and secondary information (e.g., bibliographers, catalogers, classifiers). Another function identified in the manpower study was "searching for data and information on behalf of others." This function corresponds directly with our generic function of identification and location. In both instances, the function relates to secondary information used to identify and locate primary recorded information. However, the function "analyzing data and information on behalf of others" did not make a distinction between analysis of primary information (e.g., financial analysts, operations analysts) and analysis of information identified from recorded information. The "remaining operational functions" refer to all the other functions performed on secondary information (i.e., recordation, reproduction, storage, organization and control, and access). The management of information units is a function that is common to both the earlier survey of librarians and information professionals as well as the information processing functions. It is distinctive in the sense that a manager must have some competencies in all the functions performed in an information unit as well as special competencies associated with administration and management.

THE INFORMATION PROFESSION

In the preceding sections we alluded several times to "the information profession" which we define and discuss in this chapter. To begin with it is useful to understand the meaning of disciplines and professions. We consider a discipline as being the body of knowledge in a field, which includes both recorded knowledge found in books, journal articles and so on, as well as knowledge found in the collective minds of its professionals. A profession then is the demonstration of this knowledge. Professions normally have three components: practitioners who use and apply the knowledge, educators who impart the knowledge to professionals, and researchers and scholars who, through their studies, add to the knowledge of the disciplines and, consequently, the performance of the professionals.

The contributions made by a profession to society depend on the quality of its professionals in terms of their performance in practice, education, and research. The performance of the professionals is directly related to their competencies. We will show later that, at least as far as the information professions are concerned, professional competencies consist of knowledge acquired by professionals as well as their skills and attitudes. Knowledge is gained through experience and during formal education, through university and college curricula which are developed from research in a discipline, and feedback gained from practitioners or from their places of employment. Skills of professionals are acquired largely through training, although some are acquired through the educational process and most are acquired during formal and informal on-the-job training. Attitudes of professionals toward their profession and their work are also an important aspect of professional competence.

As pointed out earlier, the information community is made up of many institutional participants such as publishers, information clearinghouses, educational institutions, libraries and information units which serve information creators, communicators and users. The librarians and information professionals, who work in these places, are professionals who spend the greatest proportion of their professional time in organizing or processing information on behalf of others. Librarians and information professionals also include people who manage information programs; perform information research, or develop new technology; or educate and train information workers and users.

In 1980 estimates showed that there were nearly 1.6 million librarians and information professionals whose principal work was processing and handling information on behalf of others. Most of these professionals are practitioners who for the most part either directly support creators, communicators and users of primary information, or are involved in functions such as recordation, reproduction, storage, identification and location, and access to information.

Practicing Librarians and Information Professionals

In order to accommodate the vast amount of information use, an extensive information profession has developed. For example, in recording and reproducing information, there are about 180,000 librarians and information professionals who are found in industry, government, and universities. These people are not only concerned about information provided in printed media, but also textual, numeric, graphic and cartographic information found in electronic media as well. They are concerned with acquiring information, editing or transforming it, recording it in a usable way, and providing it through printed copies, broadcasts, or electronic disks, tapes, and other media.

Similarly, many people are engaged professionally in storing and providing access to information. Libraries have traditionally served as the means for storing and providing access to information in printed form. There are about 140,000 professional librarians in the U.S. who are now concerned with acquiring, circulating, storing, and providing access to information in nearly all conceivable information forms. In addition to the traditional library settings, about 130,000 librarians and information professionals perform similar activities in archives, medical records units, word processor and computer system units, and units that are concerned with special collections in science, finance, marketing, and the like.

It is interesting to note that the library profession in the U.S. seems to be growing at about the rate of growth of the constituencies served by them. This growth refers to professional librarians in the U.S., but as we mentioned earlier, librarians and information professionals are found in other working environments, such as information centers, clearinghouses, museums, etc., primarily to store and provide access to information. More recently we have begun to see the distribution of librarians and information professionals among the people they serve. For example, some scientific research groups have a librarian or information professional within the group who is designated to serve the information needs of the group. The general trend is for the numbers of non-library librarian and information professional positions to be increasing rapidly, whereas the number of library librarian and information professional positions are growing less rapidly (with a substantial variation across library types). The non-library librarians and information professionals who are also involved in storage of and access to information seem to be growing in numbers because of the extensive increase in the volume of information materials generated, and because of an increasing public awareness of the value of information.

There are two other areas of growth in the information professions. The first is use of libraries and other types of information centers. This growth is substantial, in spite of the fact that the numbers of registered users of such services are not increasing substantially. Such a rapid growth in the use of information services will require an increase in the numbers of librarians and information professionals needed to support such use. The other area of growth is in the range of services and products provided by the libraries and information centers, both in terms of the volumes and varieties of materials stored, and of the various services offered. For example, public libraries are constantly adding to their collections -- more books, more magazines, more films, more video cassettes, and now more computer software. They are also expanding their services to include such things as microcomputer access, word processing, etc. Corporate libraries, in addition to storing the traditional books, periodicals, reports, etc., are now storing corporate financial, legal and personnel records, and providing access to them.

There are estimated to be 260,000 librarians and information professionals who analyze data and information on behalf of others. These are people who research and analyze data and information from libraries, computer files and other databases for scientists, lawyers, doctors and the like. They often extract and summarize previously written materials, computer system output, or library materials, but they do not actually use the information themselves. These people work in libraries, information centers, and a relatively new kind of organization called information analysis centers. The federal government funds nearly two hundred information analysis centers that serve highly specific sub-disciplines such as materials properties, health planning, and nuclear wastes. Other places of work include financial units, management information units, and research units. The titles of these librarians and information professionals usually reflect either the profession that they serve such as engineer, hydrologist, economist or the place in which they work such as library (librarian) or computer center (computer scientist).

Because of the enormous accumulation of knowledge, it has been necessary to organize and control the information materials. This was done initially by classification and cataloging and later by other bibliographic means. Also, major projects in business and government began to become more and more mission-oriented rather than discipline oriented. This meant that teams of scientists, engineers, statisticians, marketers, managers, social scientists, and other professionals worked as teams to attack such problems as found with product creation and development, and research into space, energy, health, and the environment. Thus, information needed to solve problems had to come from many related disciplines. This multidisciplinary approach to research, combined with the huge amount of material to select from required new ways to identify and locate information. Such information access is provided through secondary information. Secondary information describes primary recorded information and its sources in order to provide access to it. Secondary information can be in the form of subject catalogs, indexes and abstracts which describe textual, numeric, graphic, and cartographic information and is published in printed and electronic media containing bibliographic (or reference), and referral (or directory) information.

Secondary information, just as primary recorded information, has the eleven basic functions of information transfer associated with it. There is creation of catalog information, indexes, and abstracts. There is also recordation and reproduction of published indexes and computer tapes prepared by abstracting and indexing services. Storage and access is provided through vendors (that provide secondary information from computer stores), libraries and information centers. Use of information is enhanced through information analysis centers and information intermediaries or brokers. There are estimated to be nearly 50,000 professionals found in the creation and preparation of secondary information in the U.S. These people are catalogers and indexers found in libraries; abstractors and indexers employed by over 2,500 abstracting and indexing services; and other creators found in specialized clearinghouses and information units that serve users in organizations such as companies or federal agencies. Many of these organizations also record, reproduce and distribute the secondary information and employ as many as 15,000 professionals who help edit, organize, and process secondary information. There also is an emerging industry of vendors of secondary information. For example, relatively large bibliographic utilities ($10 to $100 million annual volume) evolved to process secondary information (electronically) from requests submitted online. There are approximately 10,000 professionals involved in the storage and access of secondary information.

For a long time, information users have been helped by reference librarians. However in the 1950's, particularly in the United Kingdom and then the U.S., scientific teams sub-divided responsibilities into activities such as design; laboratory work; and information search, retrieval and analysis. The latter people became known as information scientists (as opposed to laboratory scientists). Other fields such as medicine and law soon followed suit. Now there are over 100,000 librarians and information professionals whose principal work involves searching for data and information on behalf of others. These individuals diagnose user needs for information, identify data sources from hundreds of computerized databases and printed publications, and search using online computer systems or manually through published materials. They often evaluate the results of searches and sometimes perform preliminary analyses. They are usually found in libraries or in the units served by them. An industry has evolved of nearly 1,000 companies and individual entrepreneurs sometimes called information brokers, who are largely devoted to searching, retrieval and analysis of secondary information. In addition to being called reference librarians these librarians and information professionals are often referred to as information scientists (regardless of the environment or discipline of user served), information specialists or information counsellors. Frequently, though, their titles bear the names of the professional groups they serve such as chemists or market researchers.

With the very large number of information units found in industry, government, and educational institutions, a special line of work for about 275,000 librarians and information professionals is management of these units. Not only are these people concerned with the information aspects of their organizations, but also with planning, directing, and administering information operations, programs, services, databases, or networks. Other support functions performed in information units such as libraries, clearinghouses, database producers, and computer centers frequently follow the example of businesses. Such functions include public relations or marketing, research, and finance. Libraries have begun to conduct their operations in a more business-like manner, thus requiring some of the competencies traditionally required in businesses.

Information Research and Technology Professionals

The extent of research and technology in the information field is also impressive in terms of numbers of professionals involved. There are over 100,000 professionals engaged in information systems design. These people design new systems or modify existing ones. They also establish procedures for carrying out word processing, evaluate system output to ensure that it meets user requirements, and document procedures for the use of systems. Well over double that number of professionals are engaged in information systems analysis which involves such activities as determining the feasibility of systems, evaluating systems, selecting data or information for inclusion in systems. Finally, a smaller, but significant, number of professionals (about 20,000) perform information research and development. Researchers study the foundation, laws, theories, and postulates related to information and information systems, operations, programs, services, networks, and databases. Applied information research concerns the use of information systems, products or services and such things as information user behavior and characteristics.

Information Educational Professionals

Because the information field has grown so rapidly in recent years, it has been necessary to train information workers and professionals outside the traditional university and college environment. In fact, there are nearly ten times the number of persons educating and training information workers outside university environments (38,000) as in universities (4,000). This education and training is performed on the job, in in-house training departments, in workshops and seminars presented all over the world, and in companies that specialize in this activity. Professional information societies blossomed in the 1960's and 70's and many of them serve librarians and information professionals through continuing education programs as well as by providing conferences and publications.

THE GROWTH OF LIBRARIANSHIP

In 1982 about 310,000 workers were employed in 44,000 libraries in the U.S. This amounts to about 0.3 percent of the labor force in the U.S. or about 0.7 percent of the information workers. Of this number, about one-half of the workers in libraries are classified as professionals, most of whom are librarians. The breakdown of type of library and level of staff is given in Table 2 below.

TABLE 2
NUMBER OF WORKERS EMPLOYED IN LIBRARIES AND PROPORTION
BY LEVEL OF STAFF IN THE U.S. IN 1982

	Type of Library				
Employee Category	Public	Academic	School	Special	All
Librarian	38%	35%	55%	37%	44%
Other Professional	5	4	3	17	5
Support Staff	57	61	42	45	50
Total	100	100	100	100	100
Number of Employees	82,150	60,290	117,750	47,410	307,600

SOURCE: Roderer, et al. [1983].

The largest share of librarians is found in school libraries (38%) with public libraries accounting for 23 percent, academic libraries 15 percent and special libraries 14 percent.

The observed growth (from 1978 to 1982) in librarianship is shown in Table 3 by type of library. The overall growth is about eight percent or about 1.9 percent per year. However, the growth over the four year period varies substantially by type of libraries; the lowest growth being in public school and public libraries (2% and 3% respectively) and the largest growth being in non-public school libraries (33%) and special libraries (20%). The growth in number of librarians employed in college and universities is about six percent. There has been a great deal of concern about the growth (or lack thereof) of librarianship in the library community. However, the growth is not too different from that which one would expect. First of all, the overall growth of the information work force is not all that great. For example, the average growth of information workers from 1970 to 1980 was only about 2.8 percent compared with 1.9 percent for librarians. Secondly, the growth in number of librarians is about equal or actually exceeds growth in number of constituents served. By number of constituents we mean the total potential population that a library is supposed to serve (e.g., the general population for public librarians, students for school librarians, etc.). For example, the number of public librarians per 10,000 population has increased since 1960 when this number was 0.9 librarians (per 10,000 population) to 1.34 in 1982, although this number appears to have leveled out over the four most recent years for which data were available.

TABLE 3

LIBRARIAN EMPLOYMENT IN THE UNITED STATES BY TYPE OF LIBRARY, WITH PROJECTIONS: 1978-1982

(000)

	Type of Library					
Year	Public	College and University	Public School	Non-public School	Special	Total
1978	30.1	19.9	50.6	10.2	15.6	126.4
1979	29.9	20.4	51.1	10.7	17.1	130.0
1980	30.4	20.4	50.6	11.8	17.5	130.7
1981	30.7	20.4	49.2	12.0	17.7	130.0
1982	31.1	21.1	51.6	13.6	18.6	136.1
			Projections			
1986	31.8	22.1	48.5	13.6	20.7	136.7
1990	33.7	20.5	46.8	13.6	22.9	137.5
			Percentage Increases			
1978-82	3	6	2	33	20	8
1982-1986	2	4	-6	—	12	*
1986-1990	6	-7	-4	—	11	1

*Less than 1%.

SOURCE: Roderer, et al. [1983]

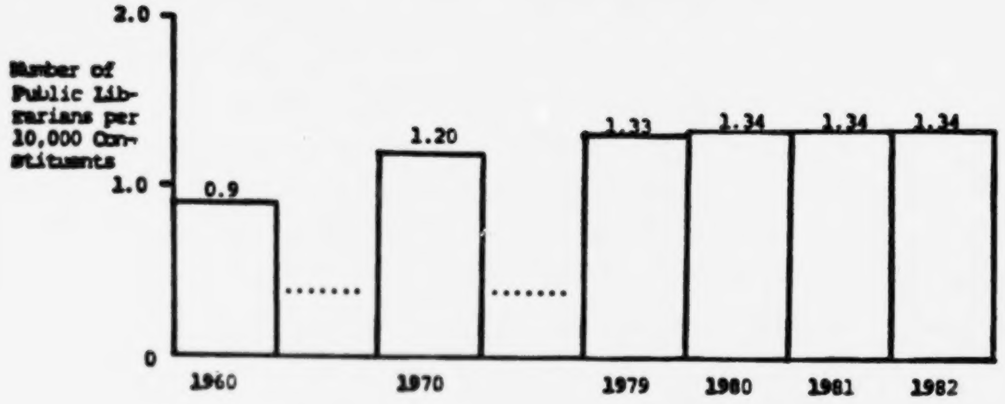

Figure 16

Number of Public Librarians per 10,000 Constituents Served (1960, 1970 and 1979-1982)

Similar results are observed for school librarians. In public schools the number of school librarians per 10,000 constituents in 1970 was about 9.1 and this number increased to 13.2 in 1981; again with the last four years about level.

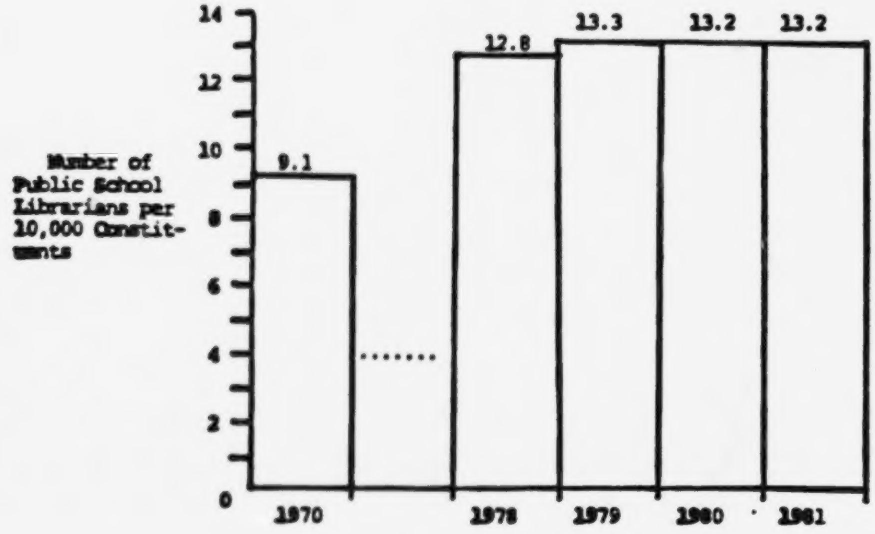

Figure 17

Number of Public School Librarians Per 10,000 Constituents Served (1970 and 1978-1981)

Since public and public school libraries are funded through public funds, it may be that the funders have generally funded the two types of libraries based on number of constituents served, or at least allocated library positions on this basis. This assertion, of course, ignores two factors: the increased requirements of libraries and the fact that some communities and many schools simply do not have libraries.

Private schools have over twice as many school librarians per 10,000 constituents and experienced a slight increase in this number from 1978 to 1981.

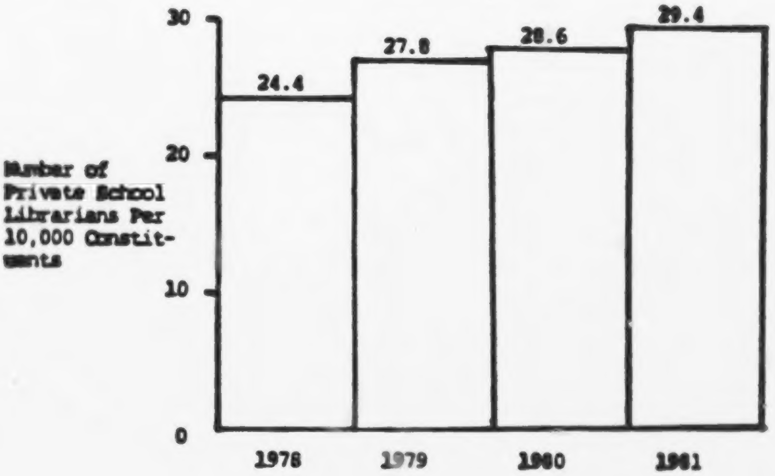

Figure 18

Number of Private School Librarians Per 10,000 Constituents Served (1978-1981)

One could argue that private school funds are greater or that there is a greater appreciation of librarianship in private schools. However, another factor may be that the ratio of elementary to secondary students is lower in private schools (i.e., there are proportionately more private high schools than elementary schools).* There are relatively more (and larger) libraries in high schools than in elementary schools.

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* There are about three private elementary schools to one private high school and slightly less than two public elementary schools to one public high school.

Academic libraries have three major constitutencies; students, instructional staff and full-time research staff. The ratio of academic librarians to these three constituencies has remained almost constant over the three or four years for which comparable data are available. The number of academic librarians per 10,000 students is shown below:

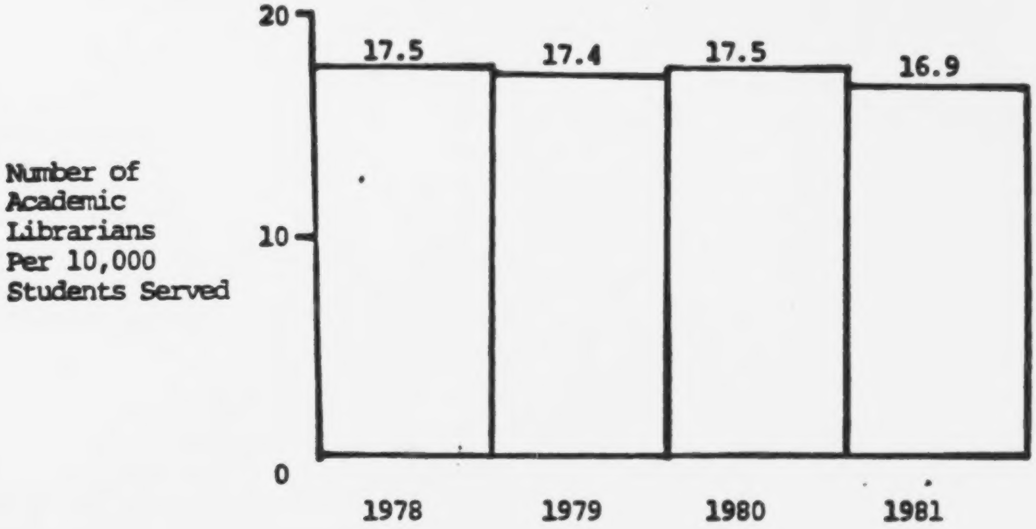

Figure 19

Number of Academic Librarians Per 10,000
Students Served (1978-1981)

There appeared to be a slight decrease in the number of academic librarians in 1981 compared with number of students. However, when compared with full and part-time instructional staff, the number was 246, 247, and 243 librarians per 10,000 staff in 1978, 1979, and 1980 respectively. Over the three years the number of librarians ranged from 2,590 to 2,610 per 10,000 scientists and engineers* served.

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* Note that there is overlap between instructional staff and scientists and engineers employed at universities and colleges, so that some professionals may be served by both academic and special libraries.

There is no perfect way to characterize the constituents of special libraries because special libraries are found in a range of settings such as those found in hospitals, research laboratories, businesses and law firms. If we use the number of individuals employed in professional, technical, and managerial and administrative occupations as a reasonable categorization of the special library constituents we find that the number of librarians per 10,000 constituents decreased very slightly from 1978 to 1981. It appears that the substantial growth in number of special librarians merely reflects the equivalent growth in their constituents served.

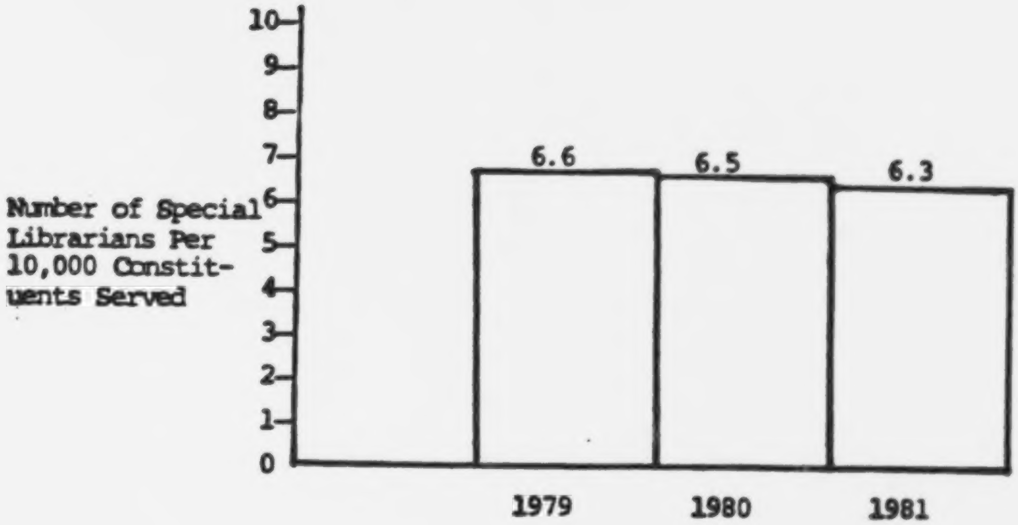

Figure 20

Number of Special Librarians Per 10,000 Constituents Served (1978-1981)

One problem in the library community is the phenomenal growth in libraries observed in the 1960's and early 1970's; particularly compared with the number of constituents served. The library schools expanded accordingly (see Figure 24). In 1960 the number of MLS degrees awarded from ALA accredited programs was about 1,700. This number grew rapidly until 1974 and 1975 when there were nearly 6,300 such degrees awarded. This represented an increase of over ten percent per year up to that time.

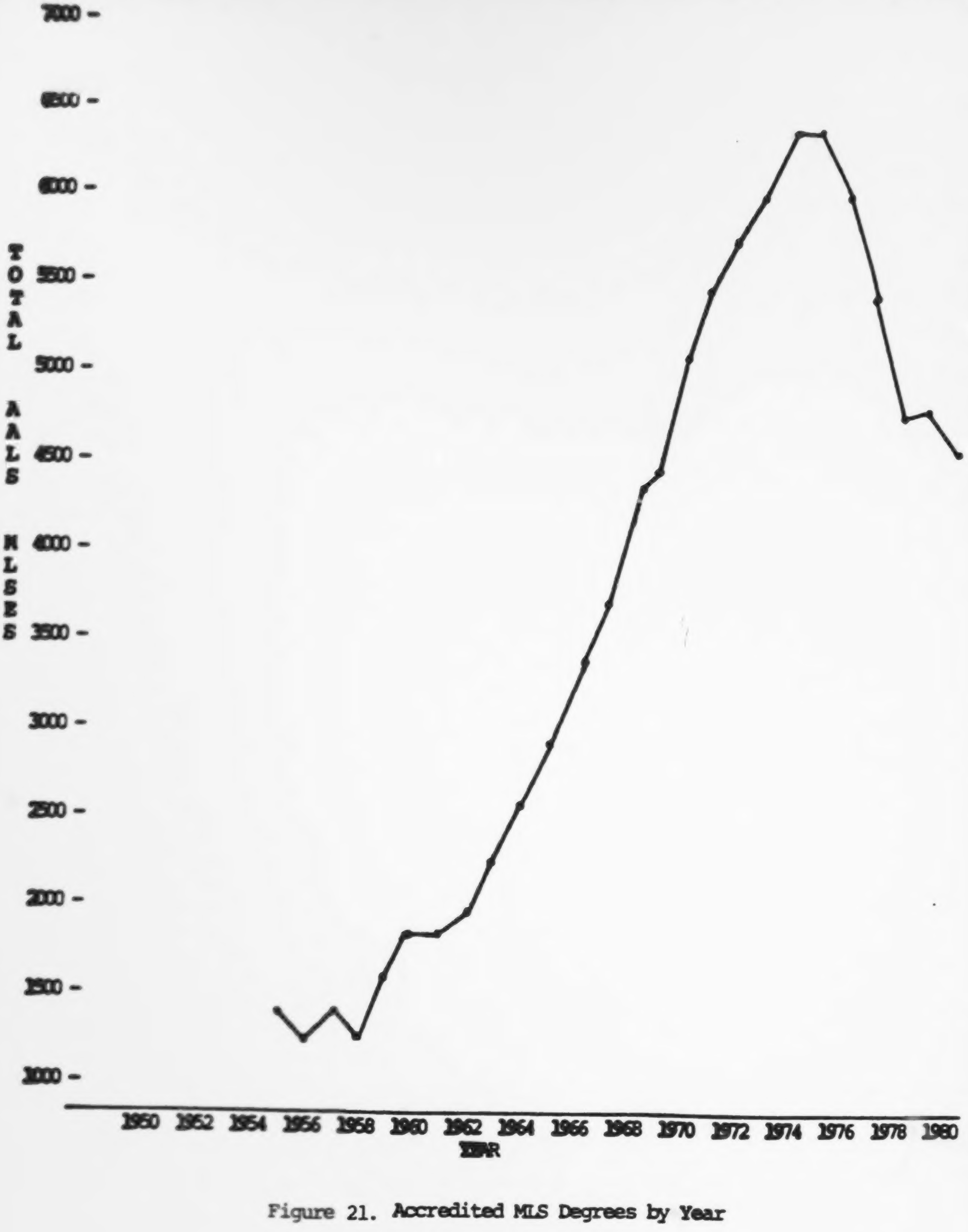

Figure 21. Accredited MLS Degrees by Year

This growth rate is far greater than exhibited in any of the constituencies mentioned above. Some of this growth may have resulted from the accelerated entry into the information age that began in the early 1960's. However, as the expansion began to slow down to the point where the proportion of information workers represented in the labor force leveled off, the library schools began to suffer. From 1975 to 1981 the number of MLS degrees awarded from ALA-accredited programs dropped from 6,300 to 3,800. This phenomenon is probably the basis for the substantial concern in the library community as several library schools are closing or have closed.

Another characteristic of the over-supply was an accompanying sharp decrease in starting salaries. These salaries reached a peak (in constant dollars) in 1969-1970, dropped off until 1977 and then began to rise back to the 1967 level. This phenomenon has been attributed to the fact that the library profession is dominated by women who have generally been paid lower salaries. At the same time the proportion of women entering the labor market from schools is increasing, but very slightly (81% of MLS graduates in 1977 were women and 82% in 1981). The level of salaries possibly could reflect the dominance of women, but the fluctuation is more likely related to the supply and demand of the labor market. This also seems to be a more influential factor as new library school graduates have other options for employment, particularly graduates of schools that offer information science or information studies programs. We are more optimistic about the future of the profession than the outlook represented by the forecasts made in the human resources study, particularly for school librarians and special librarians. However, it is interesting to note that both of these specialties require subject knowledge (i.e., education, science, law, medicine, etc.).

CHAPTER 5

LIBRARIAN AND INFORMATION PROFESSIONAL COMPETENCIES

The librarian and information professional competencies identified and validated using the methods described in Chapter 3 were organized according to the framework discussed in Chapter 2. In other words, the competencies (knowledge, skills, and attitudes) were organized by work setting, function performed, and professional level. The following work settings and functions were identified:

A. Academic Library

   1. Acquisitions
   2. Cataloging
   3. Circulation and Reader Services
   4. Collection Maintenance
   5. Interlibrary Loan
   6. Management
   7. Reference
   8. Serials Control

B. Public Library

   1. Acquisitions
   2. Cataloging
   3. Circulation and Reader Services
   4. Collection Maintenance
   5. Interlibrary Loan
   6. Management
   7. Reference
   8. Serials Control

C. School Library

   1. Acquisitions
   2. Cataloging
   3. Circulation and Reader Services
   4. Collection Maintenance
   5. Interlibrary Loan
   6. Management
   7. Reference
   8. Serials Control

D. Special Library

1. Acquisitions
2. Cataloging
3. Circulation and User Services
4. Collection Maintenance
5. Interlibrary Loan
6. Management
7. Reference
8. Serials Control

E. Database Producer

1. Acquisitions
2. Thesaurus Development and Control
3. Indexing/Abstracting
4. Publications and Product Management

F. Database Distributor/Service

G. Information Center/Clearinghouse

1. Acquisitions
2. Thesaurus Development and Control
3. Indexing/Abstracting
4. Reference/Information Analysis
5. Publications and Product Management

H. Records and Information Manager

I. Archive/Museum/Collection

1. Acquisitions
2. Cataloging/Indexing
3. Reference
4. Exhibit Management
5. Organization/Management Support

J. Information Analysis Center

1. Acquisitions
2. Indexing/Abstracting
3. Reference
4. Information Analysis/Research
5. Organization/Management Support

K. Information Service Company

1. Project Management
2. Reference/Analysis of Secondary Data
3. Research, Analysis and Design
4. Marketing
5. Organization/Management Support

L. Library Systems Supplier

1. Research and Development
2. Marketing
3. Customer Support
4. Organization/Management Support

For each of the functions within each of the work settings, we defined competencies according to the following professional levels:

- Entry level - up to 3 years of professional library experience
- Mid level - 4-9 years of professional library experience
- Senior level - 10 years or more of professional library experience.

The competencies are also subdivided into the categories of knowledge, skills and attitudes, and into the various subcategories defined earlier in this report. Furthermore, for clarification purposes, we also identified the specific tasks or activities that are performed by librarians and information professionals at different professional levels, performing specific functions within the various work settings. The general organization of the competencies is displayed in Figure 22.

In reviewing the validated sets of knowledge, skills and attitudes, it soon became clear that certain competencies are required in more than one work setting or function. These generic or transferrable competencies can be grouped into three distinct sets:

- those competencies that are generic across both function and work settings
- those competencies that are generic across functions
- those competencies that are generic across work settings.

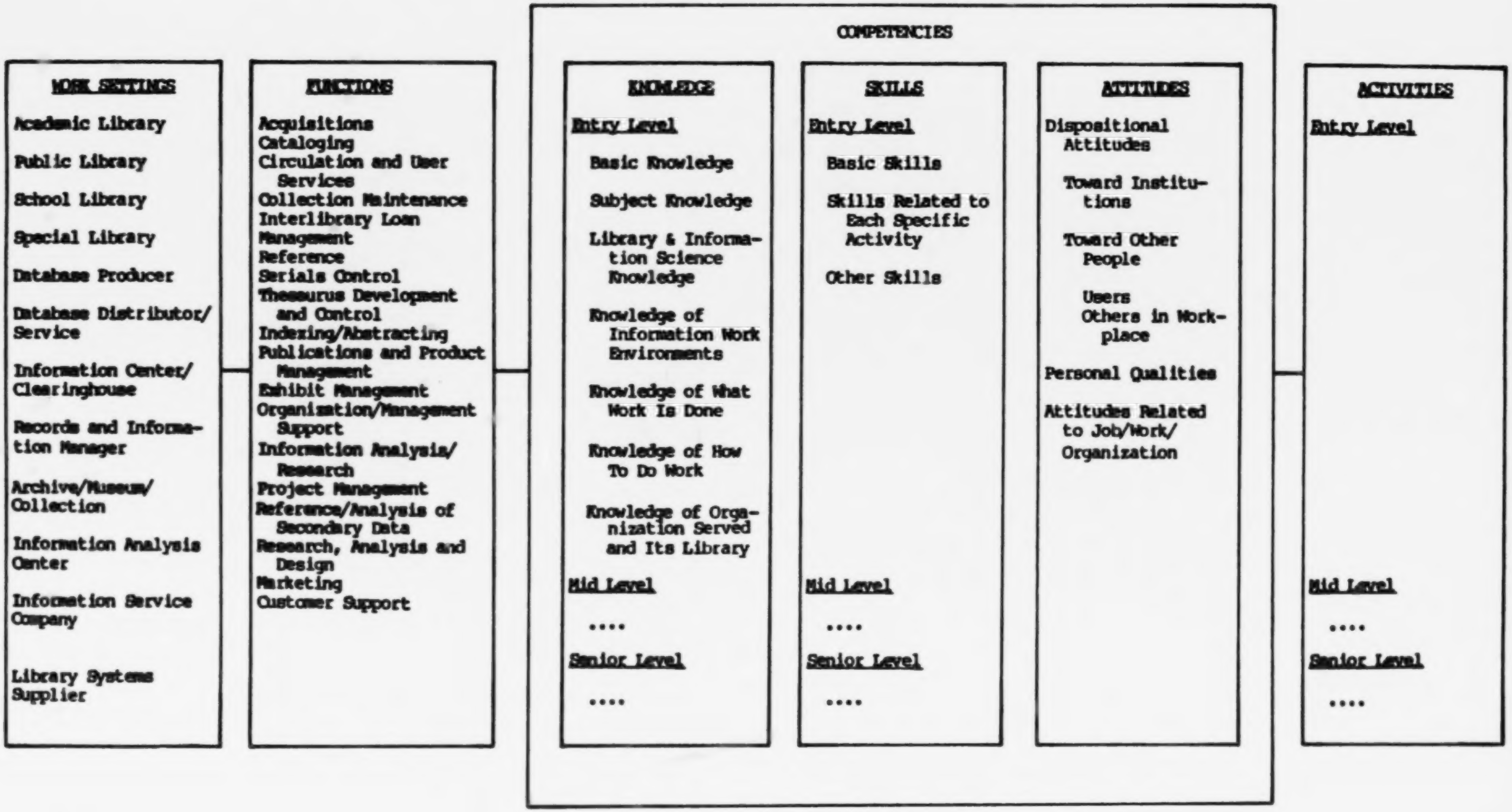
COMPETENCIES
WORK SETTINGS
Academic Library
Public Library
School Library
Special Library
Database Producer
Database Distributor/Service
Information Center/Clearinghouse
Records and Information Manager
Archive/Museum/Collection
Information Analysis Center
Information Service Company
Library Systems Supplier
FUNCTIONS
Acquisitions
Cataloging
Circulation and User Services
Collection Maintenance
Interlibrary Loan
Management
Reference
Serials Control
Thesaurus Development and Control
Indexing/Abstracting
Publications and Product Management
Exhibit Management
Organization/Management Support
Information Analysis/Research
Project Management
Reference/Analysis of Secondary Data
Research, Analysis and Design
Marketing
Customer Support
KNOWLEDGE
Entry Level
Basic Knowledge
Subject Knowledge
Library & Information Science Knowledge
Knowledge of Information Work Environments
Knowledge of What Work Is Done
Knowledge of How To Do Work
Knowledge of Organization Served and Its Library
Mid Level
....
Senior Level
....
SKILLS
Entry Level
Basic Skills
Skills Related to Each Specific Activity
Other Skills
Mid Level
....
Senior Level
....
ATTITUDES
Dispositional Attitudes
Toward Institutions
Toward Other People
Users
Others in Workplace
Personal Qualities
Attitudes Related to Job/Work/Organization
ACTIVITIES
Entry Level
Mid Level
....
Senior Level
....

Figure 22

General Organization of Competencies

In an ideal situation, we would have been able to identify and validate generic competencies across all functions and all work settings. Unfortunately, several of the competency listings were not adequately validated (i.e., they received fewer than 10 reviews) for inclusion in this analysis. Nevertheless, we were able to determine sets of competencies generic to six work settings and ten functions, as displayed in Figure 23.

COMPETENCIES GENERIC ACROSS FUNCTIONS AND WORK SETTINGS

Transferrable or generic competencies are those which can be applied in different situations. The highest level of generic competencies identified (through the validation exercise) in this project includes those competencies generic across all of the defined work settings and functions. In other words, they are competencies that have been judged by more than 50 percent of those who were active participants in the validation exercise as being essential to each function and work setting. These high-level generic competencies are displayed in Figure 24.

The competencies identified as being generic to all librarians and information professionals in all types of working environments, performing all types of functions, include basic knowledge, basic skills, communication skills, the ability to manage time effectively, a willingness to draw upon and share knowledge and experience with others, alertness, dependability, organization, willingness to take and accept responsibility, willingness to ask questions, responsiveness to time constraints, accuracy and desire to follow-through. This set of competencies should apply equally well to other types of professionals. They represent the basics for professionals. As no competencies emerged at this level which seemed specific to the information profession, we took our analysis a step further, and distinguished between competencies that are generic across all types of libraries, and those generic across non-library work settings.

Figure 23

GENERIC COMPETENCIES IDENTIFIED

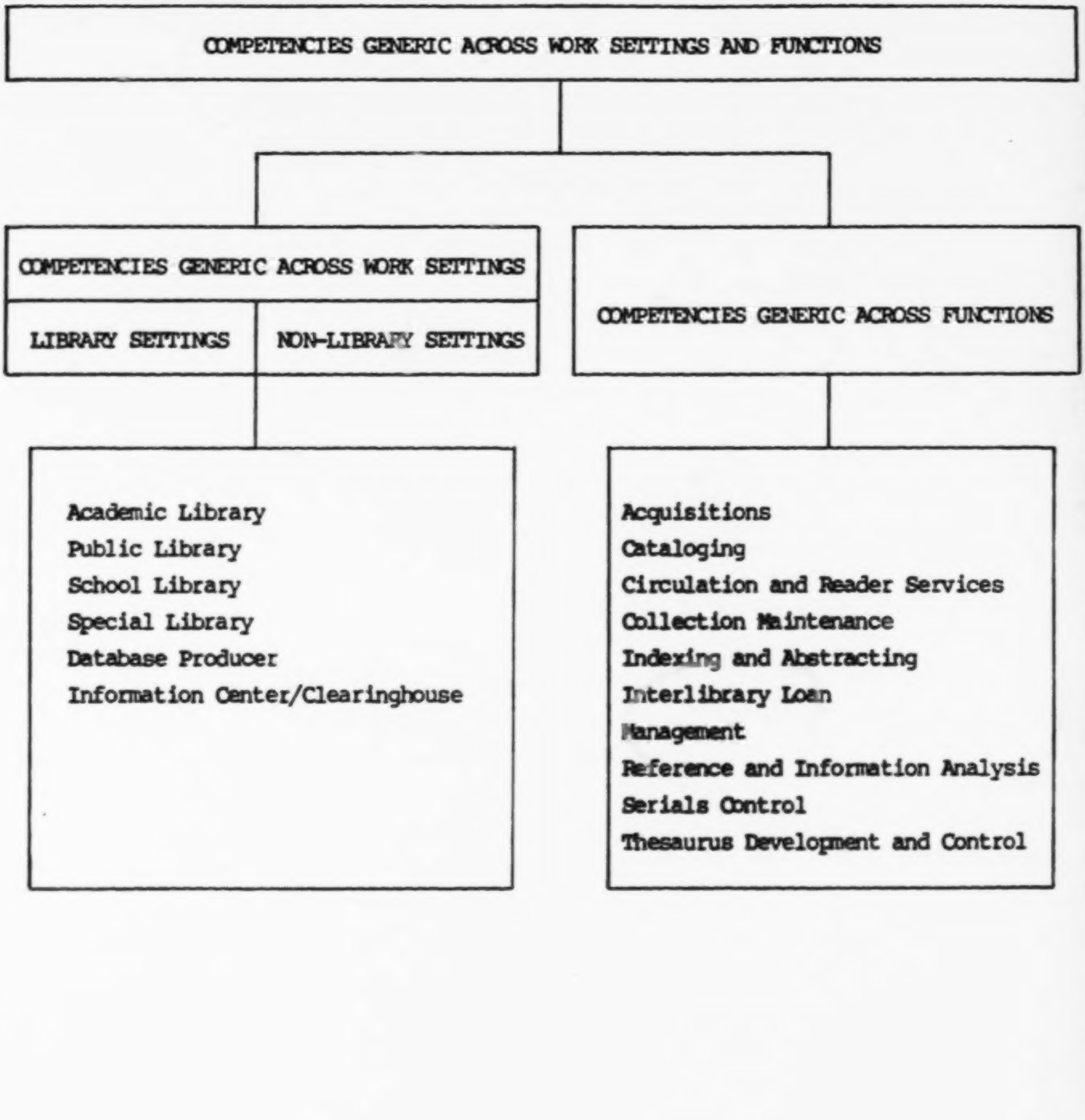
COMPETENCIES GENERIC ACROSS WORK SETTINGS AND FUNCTIONS
COMPETENCIES GENERIC ACROSS WORK SETTINGS
LIBRARY SETTINGS
NON-LIBRARY SETTINGS
COMPETENCIES GENERIC ACROSS FUNCTIONS
Academic Library
Public Library
School Library
Special Library
Database Producer
Information Center/Clearinghouse
Acquisitions
Cataloging
Circulation and Reader Services
Collection Maintenance
Indexing and Abstracting
Interlibrary Loan
Management
Reference and Information Analysis
Serials Control
Thesaurus Development and Control

Figure 24

COMPETENCIES GENERIC ACROSS ALL WORK SETTINGS AND ALL FUNCTIONS

KNOWLEDGE

knowledge related to literacy, numeracy, communications, etc.

SKILLS

literacy, numeracy, cognitive, analytical, communications, etc.
communicate well by written, verbal and non-verbal means
manage time effectively

ATTITUDES

willingness to draw upon and share knowledge and experience with others
alertness
dependability
organization
willingness to take/accept responsibility
willingness to ask questions
responsiveness to time constraints
accuracy
desire to follow-through

COMPETENCIES GENERIC ACROSS FUNCTIONS WITHIN WORK SETTINGS

The competencies that emerged as generic across all librarians and information professionals performing any of a variety of functions in any type of library include knowledge of the costs associated with library resources (materials, personnel, space, equipment, etc.), knowledge of the methods of resource allocation, and knowledge of standards, measures and methods for evaluating personnel. The additional skills considered essential include the ability to make effective, timely and well-informed decisions. The attitudes considered essential include respect for the library, respect for users, respect for co-workers, desire to learn and try, desire to work to the best of ability and positive attitudes toward the job. These competencies are displayed in Figure 25. In considering all of the competencies that are required of librarians and information professionals working in libraries, the competencies listed in Figure 25 should be added to those listed in Figure 24. At this generic level, we have begun to identify some of the attributes that are required of professionals working in service-oriented organizations and, more specifically, those who work in libraries. This is evident from the need to understand library resources, respect for the library and a respect for library users. The knowledge that is considered essential here relates to more managerial aspects of library work and often applies to the mid or senior professional levels. However, in small libraries, such knowledge could be required of any professional from entry level onwards.

The list of competencies considered to be essential across non-library, information-related work settings is somewhat longer than that for libraries, although this is probably because only two validated work settings were involved, resulting in less opportunity for disagreement. This list is displayed in Figure 26. The knowledge required of non-library librarians and information professionals (in addition to those at a higher generic level) includes knowledge of how to learn on an ongoing basis; knowledge of the performance expected on the job and how it can (and will) be measured; knowledge of job responsibilities and working conditions; knowledge of the mission, goals and objectives of the organization

Figure 25

COMPETENCIES GENERIC ACROSS ALL LIBRARY WORK SETTINGS AND LIBRARY FUNCTIONS

KNOWLEDGE

knowledge of the costs associated with library resources (materials, personnel, space, etc.)
knowledge of methods of resource allocation
knowledge of standards, measures and methods for evaluating personnel

SKILLS

make effective, timely, and well-informed decisions

ATTITUDES

respect for the library
respect users
respect co-workers
desire to learn/try
desire to work to best of ability
positive attitude toward job

Figure 26

COMPETENCIES GENERIC ACROSS ALL NON-LIBRARY WORK SETTINGS AND NON-LIBRARY FUNCTIONS

KNOWLEDGE

knowledge of how to learn on an ongoing basis
knowledge of performance expected and how it can be measured
knowledge of job responsibilities and working conditions (e.g., range of duties, probable compensation, benefits, etc.)
knowledge of the mission, goals and objectives of the organization
knowledge of the policies and procedures relevant to section operations
knowledge of the various resources available within the organization (e.g., personnel, equipment, etc.)

SKILLS

work independently and in groups
conduct meetings with individuals and groups
anticipate long-range needs of the section and of information users
design systems and procedures to improve section operations/products
budget and make projections
optimize the use of organizational and section resources

ATTITUDES

respect for the section
determination/tenacity
flexibility/versatility
objectivity
open-mindedness
sense of ethics
willingness to respond to authority, apply and follow policy
attention to detail
desire to remain current in specific and general subject field

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for which one works; knowledge of policies and procedures relevant to the section within which the professional works; knowledge of the various resources available within the organization, including personnel, equipment, facilities, etc. Skills include the ability to work independently and in groups; conduct meetings with individuals and groups; anticipate long-range needs of the section and of information users; design systems and procedures to improve section operations and products; budget and make projections; and optimize the use of organization and section resources. The essential attitudes include respect for the section; determination or tenacity; flexibility or versatility; objectivity; open-mindedness; sense of ethics; willingness to respond to authority, apply and follow policy; attention to detail; and desire to remain current in both the specific and general subject fields of the librarian and information professional.

The next level of generic competencies identified are those across functions by work setting. In other words, we extracted those competencies that are required of all librarians and information professionals who work in academic libraries, public libraries, school libraries, special libraries, database producer organizations, and information centers or clearinghouses. The sets of generic competencies for each work setting are displayed in Figures 30 to 35.

As before, the additivity of the hierarchy still stands. Thus, the competencies needed by a librarian working in an academic library, for example, are added to those competencies identified as essential for all librarians and information professionals working in libraries, and to those considered generic to all professionals. Entry level professionals in academic libraries need knowledge of how to learn on an ongoing basis; knowledge of performance expected of them and how such performance can, and will, be measured; knowledge of job responsibilities and working conditions; knowledge of the policies and procedures relevant to the library; knowledge of the various resources available within the library; knowledge of library users' information needs; and knowledge of the collection, and of related collections. At the senior professional level, the following knowledge is required: knowledge of public relations techniques; knowledge of statistical description, analysis, interpretation

Figure 27

COMPETENCIES GENERIC ACROSS ALL FUNCTIONS WITHIN THE ACADEMIC LIBRARY SETTING

KNOWLEDGE

ENTRY LEVEL

- knowledge of how to learn on an ongoing basis
- knowledge of performance expected and how it can be measured
- knowledge of job responsibilities and working conditions (e.g., range of duties, probable compensation, benefits, etc.)
- knowledge of the policies and procedures relevant to the library (or information center)
- knowledge of the various resources available within the library (e.g. personnel, equipment, etc.)
- knowledge of the users' information needs and requirements
- knowledge of the collection, and of related collections

SENIOR LEVEL

- knowledge of public relations techniques
- knowledge of statistical description, analysis, interpretation and presentation
- knowledge of cost analysis and interpretation methods
- knowledge of alternative management structures and their implications for the operation of the library
- state-of-the-art knowledge of library research and practice

SKILLS

ENTRY LEVEL

- establish rapport with users and colleagues
- work independently and in groups
- develop criteria for evaluation

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MID LEVEL

skills listed above are developed to a greater extent
perceive the needs of the organization and not just the library
anticipate long-range needs of library

SENIOR LEVEL

skills listed above are developed to a greater extent
apply methods of measurement and evaluation
budget and make projections
optimize the use of library resources

ATTITUDES

respect for profession
respect for the parent organization
support of co-workers
confidence
fairness
objectivity
willingess to respond to authority, apply and follow policy
attention to detail

and presentation, knowledge of cost analysis and interpretation methods, knowledge of alternative management structures and their implications for operating the library; and state-of-the-art knowledge of library-related research and practice.

The skills essential for the academic librarian to possess include the ability to establish rapport with users and colleagues; work independently and in groups; develop criteria for evaluation of personnel, systems, services, operations, etc., at the entry level. At the mid level, these skills are required to a greater degree of development and, in addition, the ability to perceive the needs of the organization (in this instance, an educational institution) and not just the library itself, and to anticipate the long-range needs of the library are essential. Senior level professionals require all the skills required at lower levels, but to a more developed degree, as well as the ability to apply methods of measurement and evaluation, budget and make projections, and optimize the use of the library.

Attitudes considered essential to the academic librarian include respect for the profession; respect for the parent institution; support for co-workers; confidence; fairness; objectivity; willingness to respond to authority, apply and follow policy; and attention to detail.

The competencies essential for successful performance as a public librarian are very similar to those for the academic librarian, as displayed in Figure 28. In the public library setting, entry level librarians and information professionals should possess knowledge of the users of information services and products, the characteristics of these users and their information use habits. The ability to make decisions and recommendations based on available information is a skill considered essential in public libraries. Other differences relate to the attitudes of the librarians and information professionals. In the public library, sensitivity to the needs of others, flexibility and versatility, a sense of ethics, willingness to risk failure, and a service orientation are considered essential attitudes.

Figure 28

COMPETENCIES GENERIC ACROSS ALL FUNCTIONS WITHIN THE PUBLIC LIBRARY SETTING

KNOWLEDGE

ENTRY LEVEL

knowledge of how to learn on an ongoing basis
knowledge of the users of the services and products, their characteristics and information habits
knowledge of performance expected and how it can be measured
knowledge of job responsibilities and working conditions (e.g., range of duties, probable compensation, benefits, etc.)
knowledge of the policies and procedures relevant to the library (or information center)
knowledge of the users' information needs and requirements
knowledge of the collection, and of related collections

MID LEVEL

greater depths of knowledge specified above

SENIOR LEVEL

knowledge of public relations techniques
knowledge of statistical description, analysis, interpretation and presentation
knowledge of cost analysis and interpretation methods
state-of-the-art knowledge of library research and practice

SKILLS

ENTRY LEVEL

make decisions and recommendations based on available information
work independently and in groups

MID LEVEL

skills listed above are developed to a greater extent
perceive the needs of the community and not just the library

SENIOR LEVEL

- skills listed above are developed to a greater extent
- apply methods of measurement and evaluation
- budget and make projections
- optimize the use of library resources

ATTITUDES

- respect for profession
- respect for the parent organization
- sensitive to others' needs
- fairness
- flexibility/versatility
- inquisitiveness
- patience
- sense of ethics
- willingess to respond to authority, apply and follow policy
- willingness to risk failure
- service orientation

Competencies generic across all functions within the school library setting are displayed in Figure 29. Here, for the first time, we begin to see the appearance of some of the general library and information science knowledge: knowledge of alternative approaches to the organization of information and knowledge of alternative approaches to retrieval of information. Other knowledge that has not been considered essential in either the academic or public library work settings is knowledge of the structure of the organization (i.e., the school) and the role of the library within it, and knowledge of the various projects, programs and key personnel within the organization.

School libraries consider the ability to arbitrate and negotiate, and to isolate and define problems and solve them, as necessary skills. They also consider it essential to like children. Other important attitudes that did not emerge as necessary for academic or public librarians are determination, tenacity, attention to detail, and willingness to take initiative.

The competencies considered essential for special librarians are displayed in Figure 30. They are essentially an accumulation of those competencies considered essential in other types of libraries. However, certain attitudes and perspectives do seem to emerge as relevant to special librarians, including respect for parent organization, view of library as part of a larger information environment, view of library as an organization itself, and a desire to grow professionally.

Competencies that are generic across all functions within the information center/clearinghouse work setting are displayed in Figure 31. The most obvious difference between this set of generic competencies and the preceding sets is the need for subject knowledge in an appropriate field.

Finally, the competencies generic to all database producer environments are displayed in Figure 32. Only two attitudes were identified as generic: respect for users and emotional stability.

Figure 29

COMPETENCIES GENERIC ACROSS ALL FUNCTIONS WITHIN THE SCHOOL LIBRARY SETTING

KNOWLEDGE

ENTRY LEVEL

knowledge of alternative approaches to the organization of information
knowledge of alternative approaches to retrieval of information
knowledge of the users of the services and products, their characteristics and information habits
knowledge of the mission, goals and objectives of the organization served
knowledge of the structure of the organization and the role of the library (or information center) within the organization
knowledge of the various projects and key personnel within the organization
knowledge of the policies and procedures relevant to the library (or information center)
knowledge of the various resources available within the library (e.g. personnel, equipment, etc.)
knowledge of the users' information needs and requirements
knowledge of the collection, and of related collections

MID LEVEL

greater depths of knowledge specified above

SENIOR LEVEL

greater depths of knowledge specified above
knowledge of public relations techniques

knowledge of statistical description, analysis, interpretation and presentation

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SKILLS

ENTRY LEVEL

- establish rapport with users and colleagues
- make decisions and recommendations based on available information
- work independently and in groups
- isolate and define problems and develop the necessary criteria and action for their solution

MID LEVEL

- skills listed above are developed to a greater extent
- perceive the needs of the organization and not just the library
- anticipate long-range needs of library
- design systems and procedures to improve library operations
- arbitrate and negotiate

SENIOR LEVEL

- skills listed above are developed to a greater extent
- apply methods of measurement and evaluation
- budget and make projections
- optimize the use of library resources

ATTITUDES

- like people in general
- like children
- like to help people
- sensitive to others' needs
- like to work with others/as a team
- like to work on own
- supportive of co-workers
- determination/tenacity
- flexibility/versatility
- objectivity
- open-mindedness
- patience
- resourceful
- sense of ethics
- willingness to take initiative
- attention to detail
- service orientation
- willingness to promote library and its services
- desire to grow professionally
- desire to remain current in specific and general subject field

Figure 30

COMPETENCIES GENERIC ACROSS ALL FUNCTIONS WITHIN THE SPECIAL LIBRARY SETTING

KNOWLEDGE

ENTRY LEVEL

knowledge of definition, structure, and formats of information
knowledge of alternative approaches to retrieval of information
knowledge of how to learn on an ongoing basis
knowledge of the users of the services and products, their characteristics and information habits
knowledge of performance expected and how it can be measured
knowledge of job responsibilities and working conditions (e.g., range of duties, probable compensation, benefits, etc.)
knowledge of the mission, goals and objectives of the organization served
knowledge of the structure of the organization and the role of the library (or information center) within the organization
knowledge of the policies and procedures relevant to the library (or information center).
knowledge of the various resources available within the library (e.g. personnel, equipment, etc.)
knowledge of the users' information needs and requirements
knowledge of the collection, and of related collections

MID LEVEL

greater depths of knowledge specified above

SENIOR LEVEL

- greater depths of knowledge specified above
- knowledge of public relations techniques
- knowledge of statistical description, analysis, interpretation and presentation
- knowledge of cost analysis and interpretation methods
- knowledge of alternative management structures and their implications for the operation of the library
- state-of-the-art knowledge of library research and practice

SKILLS

ENTRY LEVEL

- establish rapport with users and colleagues
- make decisions and recommendations based on available information
- isolate and define problems and develop the necessary criteria and action for their solution

MID LEVEL

- skills listed above are developed to a greater extent
- perceive the needs of the organization and not just the library
- anticipate long-range needs of library
- design systems and procedures to improve library operations
- arbitrate and negotiate

SENIOR LEVEL

- skills listed above are developed to a greater extent
- apply methods of measurement and evaluation
- budget and make projections
- optimize the use of library resources

ATTITUDES

respect for profession
respect for the parent organization
like people in general
like to help people
sensitive to others' needs
like to work with others/as a team
supportive of co-workers
confidence
determination/tenacity
emotional stability
fairness
flexibility/versatility
objectivity
open-mindedness
patience
resourceful
sense of ethics
tolerance
willingess to respond to authority, apply and follow policy
willingness to risk failure
attention to detail
service orientation
view of library as part of a larger information environment
view of library as an organization
desire to grow professionally
desire to remain current in specific and general subject field

Figure 31

COMPETENCIES GENERIC ACROSS ALL FUNCTIONS WITHIN THE INFORMATION CENTER/CLEARINGHOUSE SETTING

KNOWLEDGE

ENTRY LEVEL

knowledge of the primary subject field of users served (e.g., education, medicine, chemistry, law, etc.)
knowledge of the users' information needs and requirements

MID LEVEL

greater depths of knowledge specified above

SENIOR LEVEL

greater depths of knowledge specified above
knowledge of the costs associated with resources (materials, personnel, space, etc.)
knowledge of standards, measures and methods for evaluating personnel

SKILLS

SENIOR LEVEL

skills listed above are developed to a greater extent
apply methods of measurement and evaluation

ATTITUDES

respect for profession
respect for the parent organization
respect co-workers
like to work on own
supportive of co-workers
willingness to take initiative
realization that there is no single "right" way to achieve the goals of the section/organization
desire to learn/try
willingness to risk failure
desire to work to best of ability
willingness to get hands dirty
positive attitude toward job

Figure 32

COMPETENCIES GENERIC ACROSS ALL FUNCTIONS WITHIN THE DATABASE PRODUCER SETTING

ATTITUDES

respect users
emotional stability

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COMPETENCIES GENERIC ACROSS WORK SETTING BY FUNCTION

Our final analysis of generic sets was to consider those competencies that were validated as essential to the successful performance of an information-related function regardless of the setting within which it is performed. Upon completion of the validation exercise, we had received a minimum of 10 validated sets for ten of the functions: acquisitions, cataloging, circulation and user services, collection maintenance, interlibrary loan, indexing and abstracting, management, serials control, thesaurus construction and control, and reference and information analysis. The competencies generic to each of these information-related functions are displayed in Figures 33 to 42. As before, in order for a competency to be considered generic to a function, it must have been scored as "essential" by over 50 percent of the respondents for that function in each work setting appropriate to that function.

Competencies generic to the acquisitions function, displayed in Figure 33, include knowledge of acquisitions tools and sources of bibliographic information, knowledge of acquisition methods and techniques, knowledge of how to perform the various acquisition activities (all activities identified are listed in Volume 2), knowledge of how to use the acquisitions tools and sources of bibliographic information, and knowledge of how to apply the acquisitions methods and techniques, at the entry level. At the mid level are included knowledge of the operations of other sections of the library/organization and how they relate to acquisitions, and knowledge of available vendor-supplied systems, services and products to support acquisitions. At the senior professional level, state-of-the-art knowledge of library and information science research and practice as it relates to acquisitions is added.

The skills that are generic to the acquisitions function include, at the mid level, the ability to perceive the needs of the organization or community and not just the library; and at the senior professional level, the ability to apply methods of measurement and evaluation in addition to the skills required at the lower levels.

Figure 33

ACQUISITIONS COMPETENCIES GENERIC ACROSS ALL WORK SETTINGS

KNOWLEDGE

ENTRY LEVEL

knowledge of acquisition tools and sources of bibliographic information
knowledge of acquisition methods and techniques
knowledge of how to perform the various acquisition activities
knowledge of how to use the acquisitions tools and sources of bibliographic information
knowledge of how to apply the acquisitions methods and techniques

MID LEVEL

knowledge of the operations of other sections in the library/organization and how they relate to acquistions
knowledge of available vendor-supplied systems, services and products to support acquisitions

SENIOR LEVEL

state-of-the-art knowledge of library and information science research and practice as it relates to the acquisition of print and non-print materials and the support of data collection in specific subjects

SKILLS

MID LEVEL

perceive the needs of the organization and not just the library

SENIOR LEVEL

skills listed above are developed to a greater extent
apply methods of measurement and evaluation

If you are wondering why this list is relatively short, and why no attitudes appear in the list, it is because the competencies listed in other generic sets should be added to each set described in this section.

Competencies generic to librarians and information professionals performing the cataloging function are displayed in Figure 34. As with the acquisitions function, a set of generic competencies emerges relating to knowledge of relevant tools, sources of information, methods, techniques, how to perform the activities, how to use the tools and sources of information, and how to apply the methods and techniques. Additional knowledge essential to the cataloging function includes knowledge of the definition, structure and formats of information; knowledge of the function itself, the range of services and products offered; and knowledge of the users' information needs and requirements. At the senior level, knowledge of statistical description, analysis, interpretation and presentation; knowledge of cost analysis and interpretation methods; and knowledge of alternative management structures and their implications for the operation of the library/section are added.

Required skills for the cataloger include the ability to collect, analyze and interpret data, make decisions and recommendations, and identify and solve problems. Attitudes include respect for the parent organization, willingness to work alone and in groups, confidence, neatness, resourcefulness, desire to grow professionally, etc.

The competencies, generic across all work settings, that relate to circulation and user services follow a similar pattern to those previously described. Included are knowledge of the definition, structure, and formats of information; knowledge of users; knowledge of the function itself; knowledge of the activities required to offer the services and products, and how to perform them; knowledge of systems, methods and techniques, and how to use and apply them; knowledge of policies and procedures, resources, collections and users of the specific library or information unit within an organization.

Figure 34

CATALOGING COMPETENCIES GENERIC ACROSS ALL WORK SETTINGS

KNOWLEDGE

ENTRY LEVEL

knowledge of definition, structure, and formats of information
knowledge of the cataloging function, the range of services and products offered (both actual and potential)
knowledge of the cataloging activities that are required to offer the services and produce the products
knowledge of cataloging tools and sources of bibliographic information
knowledge of cataloging methods and techniques
knowledge of how to perform the various cataloging activities
knowledge of how to use the cataloging tools and sources of bibliographic information
knowledge of how to apply the cataloging methods and techniques
knowledge of the users' information needs and requirements

MID LEVEL

knowledge of the operations of other sections in the library/organization and how they relate to cataloging

SENIOR LEVEL

knowledge of statistical description, analysis, interpretation and presentation
knowledge of cost analysis and interpretation methods
knowledge of alternative management structures and their implications for the operation of the library/section
state-of-the-art knowledge of related research and practice

SKILLS

ENTRY LEVEL

collect, analyze and interpret data
make decisions and recommendations based on available information
isolate and define problems and develop the necessary criteria and action for their solution

MID LEVEL

skills listed above are developed to a greater extent

SENIOR LEVEL

skills listed above are developed to a greater extent
apply methods of measurement and evaluation

ATTITUDES

respect for the parent organization
like to work with others/as a team
like to work on own
confidence
emotional stability
fairness
inquisitiveness
neatness
patience
resourceful
view of library as part of a larger information environment
ability to sacrifice short-term gains for long-term goals
desire to grow professionally

The skills required to perform the circulation and user services function include those listed under acquisitions and cataloging. Also essential is the ability to establish rapport with users and colleagues. Attitudes are also similar to those included in preceding lists, with the addition of willingness to perform clerical tasks. These competencies are displayed in Figure 35.

The competencies generic to other functions follow much the same pattern and are displayed in Figures 36 to 42. Interesting differences include the requirement for subject knowledge for the collection maintenance, indexing and abstracting, thesaurus construction and control, and the reference and information analysis functions. Abstractors, indexers, and vocabulary constructors need knowledge of proofreading techniques and procedures, and quality and production control techniques and procedures. Certain types of work are essentially sedentary and require the ability to perform sedentary work, such as indexing and abstracting, and thesaurus construction.

The management function appears to require a highly comprehensive set of competencies, as might be expected. They include, for example, knowledge of alternative approaches to the organization, retrieval and management of information; knowledge of available and emerging information technologies and their applications; knowledge of the expanding information community; knowldege of the contracting process; ability to supervise staff; ability to apply methods of measurement and evaluation; tolerance; and political sense.

Figure 35

CIRCULATION AND USER SERVICES COMPETENCIES GENERIC ACROSS ALL WORK SETTINGS

KNOWLEDGE

ENTRY LEVEL

- knowledge of definition, structure, and formats of information
- knowledge of the users of the services and products, their characteristics and information habits
- knowledge of the circulation function, the range of services and products offered (both actual and potential)
- knowledge of the circulation activities that are required to offer the services and produce the products
- knowledge of circulation systems
- knowledge of circulation methods and techniques
- knowledge of how to perform the various circulation activities
- knowledge of how to use the circulation systems
- knowledge of how to apply the circulation methods and techniques
- knowledge of the policies and procedures relevant to the library (or information center)
- knowledge of the various resources available within the library (e.g., personnel, equipment, etc.)
- knowledge of the users' information needs and requirements
- knowledge of the collection, and of related collections

MID LEVEL

- knowledge of the operations of other sections in the library/ organization and how they relate to circulation and user services

SENIOR LEVEL

- knowledge of statistical description, analysis, interpretation and presentation
- knowledge of cost analysis and interpretation methods
- knowledge of alternative management structures and their implications for the operation of the library/section

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SKILLS

ENTRY LEVEL

perform each activity
establish rapport with users and colleagues
make decisions and recommendations based on available information

MID LEVEL

skills listed above are developed to a greater extent
perceive the needs of the organization and not just the library

SENIOR LEVEL

skills listed above are developed to a greater extent
apply methods of measurement and evaluation

ATTITUDES

respect for profession
respect for the parent organization
like people in general
like to help people
like to meet people
sensitive to others' needs
like to work with others/as a team
like to work on own
supportive of co-workers
enjoy managing/supervising others
confidence
cheerfulness
diplomacy
emotional stability
fairness
optimism/positive attitude
patience
resourceful
sensitive/thoughtful
tolerance
willingness to take initiative
willingness to do clerical tasks
service orientation
willingness to promote library and its services
view of library as part of a larger information environment
ability to see broad picture
desire to grow professionally

Figure 36

COLLECTION MAINTENANCE COMPETENCIES GENERIC ACROSS ALL WORK SETTINGS

KNOWLEDGE

ENTRY LEVEL

knowledge of the primary subject field of users served (e.g., medicine, chemistry, law, etc.)
knowledge of the users of the services and products, their characteristics and information habits
knowledge of the collection maintenance function, the range of services and products offered (both actual and potential)
knowledge of the collection maintenance activities that are required to offer the services and produce the products
knowledge of collection maintenance tools and sources of information
knowledge of collection maintenance methods and techniques
knowledge of how to perform the various collection maintenance activities
knowledge of how to use the collection maintenance tools and sources
knowledge of how to apply the collection maintenance methods and techniques
knowledge of the users' information needs and requirements
knowledge of the collection, and of related collections

MID LEVEL

greater depths of knowledge specified above
knowledge of the operations of other sections in the library/organizization and how they relate to collection maintenance
knowledge of public relations techniques
knowledge of statistical description, analysis, interpretation and presentation
knowledge of cost analysis and interpretation methods
knowledge of alternative management structures and their implications for the operation of the library/section
state-of-the-art knowledge of related research and practice

SKILLS

ENTRY LEVEL

establish rapport with users and colleagues

MID LEVEL

skills listed above are developed to a greater extent
perceive the needs of the organization and not just the library

SENIOR LEVEL

apply methods of measurement and evaluation

ATTITUDES

respect for profession
respect for the parent organization
like to work with others/as a team
supportive of co-workers
confidence
emotional stability
fairness
optimism/positive attitude
tolerance
willingness to take initiative

Figure 37

INTERLIBRARY LOAN COMPETENCIES GENERIC ACROSS ALL WORK SETTINGS

KNOWLEDGE

ENTRY LEVEL

- knowledge of the interlibrary loan function, the range of services and products offered (both actual and potential)
- knowledge of the interlibrary loan activities that are required to offer the services and produce the products
- knowledge of interlibrary loan tools and sources of information
- knowledge of interlibrary loan methods and techniques
- knowledge of how to perform the various interlibrary loan activities
- knowledge of how to use the interlibrary loan tools and sources
- knowledge of how to apply the interlibrary loan methods and techniques
- knowledge of the users' information needs and requirements
- knowledge of the collection, and of related collections

MID LEVEL

- greater depths of knowledge specified above
- knowledge of the operations of other sections in the library/ organization and how they relate to interlibrary loan
- knowledge of available vendor-supplied systems, services and products to support interlibrary loan

SENIOR LEVEL

- greater depths of knowledge specified above
- knowledge of public relations techniques
- knowledge of statistical description, analysis, interpretation and presentation
- knowledge of cost analysis and interpretation methods
- knowledge of alternative management structures and their implications for the operation of the library/section

SKILLS

ENTRY LEVEL

establish rapport with users and colleagues
make decisions and recommendations based on available information

MID LEVEL

skills listed above are developed to a greater extent
perceive the needs of the organization and not just the library

SENIOR LEVEL

skills listed above are developed to a greater extent
apply methods of measurement and evaluation

ATTITUDES

like to help people
sensitive to others' needs
like to work with others/as a team
like to work on own
supportive of co-workers
patience
resourceful
sense of ethics
tolerance
service orientation
view of library as an organization
desire to grow professionally

Figure 38

INDEXING/ABSTRACTING COMPETENCIES
GENERIC ACROSS ALL WORK SETTINGS

KNOWLEDGE

ENTRY LEVEL

- knowledge related to literacy, numeracy, communications, etc.
- knowledge of the primary subject field of users served (e.g., medicine, chemistry, law, etc.)
- knowledge of the indexing and abstracting functions, the range of services and products offered (both actual and potential)
- knowledge of the activities that are required to offer the services and produce the products
- knowledge of indexing tools
- knowledge of indexing and abstracting methods and techniques
- knowledge of how to perform the various activities
- knowledge of how to use the indexing tools
- knowledge of how to apply the indexing and abstracting methods and techniques
- knowledge of proofreading techniques and procedures

MID LEVEL

- greater depths of knowledge specified above
- knowledge of the operations of other sections in the organization and how they relate to indexing/abstracting
- knowledge of quality and production control techniques and procedures

SENIOR LEVEL

- greater depths of knowledge specified above
- knowledge of available vendor-supplied systems, services and products to support indexing/abstracting
- state-of-the-art knowledge of research and practice in indexing and abstracting techniques

SKILLS

ENTRY LEVEL

perform each activity
apply indexing and abstracting rules consistently
perceive the information needs of the user
perform sedentary work

MID-LEVEL

skills listed above are developed to a greater extent
conduct an interview
conduct meetings with individuals and groups
supervise staff

SENIOR LEVEL

skills listed above are developed to a greater extent

ATTITUDES

like to work on own
imagination
realization that there is no single "right way" to achieve the goals of the section/organization
willingness to risk failure
willingness to get hands dirty
ability to see broad picture
desire to remain current in specific and general subject field

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Figure 39

MANAGEMENT COMPETENCIES GENERIC ACROSS ALL WORK SETTINGS

KNOWLEDGE

knowledge of definition, structure, and formats of information
knowledge of alternative approaches to the organization of information
knowledge of alternative approaches to retrieval of management information
knowledge of alternative approaches to information management
knowledge of available and emerging information technologies and their applications
knowledge of completed and ongoing research in the field and its applicability to practice
knowledge of career opportunities
knowledge of the expanding information community, its participants and their interrelationships (social, economic, technical, etc.)
knowledge of the users of the services and products, their characteristics and information habits
knowledge of the management function, the range of services and products offered (both actual and potential)
knowledge of the management activities that are required to offer the services and produce the products
knowledge of management tools and sources of information
knowledge of management methods and techniques
knowledge of how to perform the various activities
knowledge of how to use the management tools and sources of management information
knowledge of how to apply the management methods and techniques
knowledge of personnel procedures
knowledge of the operations of other sections in the library/organization and how they relate to management
knowledge of the contracting process, both in general and within the organization
knowledge of evaulation methods and techniques to evaluate systems, services and products
knowledge of public relations techniques
knowledge of cost analysis and interpretation methods
knowledge of alternative management structures and their implications for the operation of the library/section
knowledge of the users' information needs and requirements
knowledge of the collection, and of related collections

SKILLS

establish rapport with users and colleagues
conduct an interview
collect, analyze and interpret data
make decisions and recommendations based on available information
supervise staff
develop criteria for evaluation
isolate and define problems and develop the necessary criteria and action for their solution
perceive the needs of the organization and not just the library
arbitrate and negotiate
apply methods of measurement and evaluation

ATTITUDES

respect for profession
respect for the parent organization
like people in general
like to help people
like to meet people
sensitive to others' needs
like to work with others/as a team
like to work on own
supportive of co-workers
enjoy managing/supervising others
assertiveness
compassion/kindness
confidence
diplomacy
emotional stability
fairness
imagination
inquisitiveness
leadership ability
optimism/positive attitude
patience
resourceful
sensitive/thoughtful
tolerance
willingness to take initiative
willingness to fail
service orientation
organizational identity
willingness to promote library and its services
view of library/section as part of a larger information environment
view of library/section as an organization
ability to see broad picture
ability to sacrifice short-term gains for long-term goals
political sense
desire to grow professionally

Figure 40

SERIALS CONTROL COMPETENCIES GENERIC ACROSS ALL WORK SETTINGS

KNOWLEDGE

ENTRY LEVEL

knowledge of definition, structure, and formats of information
knowledge of alternative approaches to retrieval of information
knowledge of the serials control function, the range of services and products offered (both actual and potential)
knowledge of the serials control activities that are required to offer the services and produce the products
knowledge of serials control tools and sources of bibliographic information
knowledge of serials control methods and techniques
knowledge of how to perform the various serials control activities
knowledge of how to use the serials control tools and sources of bibliographic information
knowledge of how to apply the serials control methods and techniques
knowledge of the users' information needs and requirements
knowledge of the collection, and of related collections

MID LEVEL

knowledge of the operations of other sections in the library/organization and how they relate to serials control
knowledge of available vendor-supplied systems, services and products to support serials control
knowledge of the contracting process, both in general and within the organization
knowledge of evaluation methods and techniques to evaluate systems, services and products

SENIOR LEVEL

knowledge of public relations techniques
knowledge of statistical description, analysis, interpretation and presentation
knowledge of cost analysis and interpretation methods
knowledge of alternative management structures and their implications for the operation of the library
state-of-the-art knowledge of related research and practice

SKILLS

ENTRY LEVEL

perform each activity
establish rapport with users and colleagues
make decisions and recommendations based on available information
isolate and define problems and develop the necessary criteria and action for their solution

MID LEVEL

skills listed above are developed to a greater extent
perceive the needs of the organization and not just the library

SENIOR LEVEL

apply methods of measurement and evaluation

ATTITUDES

like to work with others/as a team
like to work on own
supportive of co-workers
enjoy managing/supervising others
confidence
patience
resourceful

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Figure 41

THESAURUS DEVELOPMENT & CONTROL COMPETENCIES
GENERIC ACROSS ALL SETTINGS

KNOWLEDGE

SENIOR LEVEL

knowledge of the primary subject field of users served (e.g., medicine, chemistry, law, etc.)
knowledge in greater depth in specific subjects, (e.g., neuroanatomy, neurophysiology, neurosurgery, etc.)
knowledge of definition, structure, and formats of information
knowledge of alternative approaches to retrieval of information
knowledge of the users of the services and products, their characteristics and information habits
knowledge of the thesaurus development and control functions, the range of services and products offered (both actual and potential)
knowledge of the activities that are required to offer the services and produce the products
knowledge of the various resources that are necessary to support the activities
knowledge of reference tools in specific subject areas
knowledge of methods and techniques for thesaurus development and control
knowledge of how to perform the various activities
knowledge of how to use specific tools for thesaurus development and control
knowledge of how to apply the methods and techniques of thesaurus development and control
knowledge of proofreading techniques and procedures
knowledge of available systems, services and products to support thesaurus development and control
state-of-the-art knowledge of research and practice in thesaurus development and control techniques
knowledge of the structure of the organization and the role of the section within the organization
knowledge of how the thesaurus terms are used by indexers
knowledge of the operations of other sections in the organization and how they relate to thesaurus development and control

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SKILLS

SENIOR LEVEL

apply consistently the guidelines for thesaurus development and control
locate and use appropriate reference tools to provide subject support in thesaurus development and control
perceive the information needs of the thesaurus user
collect, analyze and interpret data
make decisions and recommendations based on available information
work independently and in groups
perform sedentary work
develop criteria for evaluation
isolate and define problems and develop the necessary criteria and action for their solution
arbitrate and negotiate

ATTITUDES

respect for the parent organization
respect users
like to help people
like to work with others/as a team
supportive of co-workers
diplomacy
imagination
inquisitiveness
willingness to take initiative
realization that there is no single "right" way to achieve the goals of the section/organization
ability to see broad picture
desire to remain current in specific and general subject field

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Figure 42

REFERENCE COMPETENCIES GENERIC ACROSS ALL WORK SETTINGS

KNOWLEDGE

ENTRY LEVEL

- knowledge of the primary subject field of users served (e.g., medicine, chemistry, law, etc.)
- knowledge of definition, structure, and formats of information
- knowledge of the users of the services and products, their characteristics and information habits
- knowledge of the reference function, the range of services and products offered (both actual and potential)
- knowledge of the activities that are required to offer the services and produce the products
- knowledge of reference/referral tools and sources of information
- knowledge of reference/referral methods and techniques
- knowledge of how to perform the various activities (e.g., conduct reference interviews, analyze user requests, select reference sources, formulate search, etc.)
- knowledge of how to use the reference/referral and other sources
- knowledge of how to apply the reference/referral methods and techniques
- knowledge of the collection, and of related collections

MID LEVEL

- knowledge of the operations of other sections in the library and how they relate to reference
- knowledge of available vendor-supplied systems, services and products to support reference

SENIOR LEVEL

- knowledge of cost analysis and interpretation methods
- knowledge of alternative management structures and their implications for the operation of the library

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SKILLS

ENTRY LEVEL

perform each activity
establish rapport with users and colleagues
conduct an interview
make decisions and recommendations based on available information

MID LEVEL

skills listed above are developed to a greater extent
perceive the needs of the organization and not just the library

SENIOR LEVEL

apply methods of measurement and evaluation

ATTITUDES

respect for profession
respect for the parent organization
like people in general
like to help people
like to meet people
like to make others feel comfortable
sensitive to others' needs
supportive of co-workers
confidence
diplomacy
emotional stability
imagination
inquisitiveness
optimism/positive attitude
patience
resourceful
tolerance
willingness to take initiative
service orientation
willingness to promote library and its services
view of library/organization as part of a larger information environment
ability to see broad picture
curiosity
desire to grow professionally

COMPETENCIES SPECIFIC TO FUNCTIONS AND WORK SETTINGS

Competencies specific to the functions and work settings listed at the beginning of this chapter have been identified and validated. These competencies have also been organized by the three professional levels. A complete set of the specific competencies are included in Volume 2 of this report. An example of the specific competencies considered important for a special librarian performing the reference function is included at the end of Chapter 2.

The competencies are organized according to the framework described in Chapter 2. It is important to understand the distinction between functions performed and positions or job titles. Our rationale behind the functional approach was that we were more concerned with what librarians and information professionals do, rather than what they are called. In a single-person library therefore, the librarian or information professional will undoubtedly perform more than a single function. In using and interpreting the competency data in Volume 2, it is important to consider the functions being performed by the professionals and the activities being performed to determine which competencies are appropriate. We have been comprehensive rather than exclusive in our approach and the data should be carefully reviewed before being used for any specific purpose.

CHAPTER 6

EDUCATIONAL REQUIREMENTS AND IMPLICATIONS

The various analyses that were conducted of the listings of knowledge, skills and attitudes, deemed either essential or desirable for successful performance by librarians and information professionals, yield results with implications for a number of different aspects of the educational/learning process. This overall process described, in an ideal sense, in Chapter 1 is a cyclical process involving the identification of competency requirements, determination of education and training requirements, design and implementation of curricula for competency attainment and demonstration of competency achievement through performance in the workplace. This process is a continuous one as the environment within which professional development occurs is constantly changing. As we move from an industrial and manufacturing national economy to one based increasingly on information services and products, the changes are accelerating, primarily as a result of the continued development of new information technologies and an increasing awareness of the availability and value of information on the part of users. Thus, if the educational process is to keep pace with such developments, the cycle for achieving librarian and information professional competencies needs to be accelerated accordingly. The responsibility for so doing rests firmly on the shoulders of all participants in this process: educators, professional societies, employers, and professionals themselves.

One of the clearest results of the project is that, in considering librarian and information professional competencies required in the workplace, there are some competencies that can be acquired through formal programs of education, some that can be acquired through continuing education, some that can be acquired through training and yet others that can only be acquired on the job. This may seem obvious, yet it is an important point. Too often employers complain that librarians and information professionals (and in particular those who work in libraries) are not prepared upon starting work to perform the required tasks. This attitude or expectation that professionals who have completed their education should be able to walk "cold" into an organization and start to work effectively and productively is perhaps a residual from the days when professionals were apprenticed to an organization. In other professions recent graduates — physicists, chemists, statisticians, etc. — are not expected to perform as fully-fledged professionals. There is a period of orientation and training that occurs on the job and, without which, professionals cannot perform effectively.

The problem that seems to prevail, to some degree, in the information profession is one of a mismatch of expectations and responsibilities which can only be overcome through increased communication among participants in the overall educational process. It is hoped that the results of this project will stimulate such communication, if only by providing a common framework for discussion and debate.

We view the primary requirements emerging from this project falling into five main categories:

- requirements for formal education
- requirements for training
- requirements for continuing education and training
- requirements for career planning and professional development
- new directions for the future.

These are discussed below.

REQUIREMENTS FOR FORMAL EDUCATION

Many of the requirements of librarians and information professionals are already in place, predominately in schools of librarianship (or schools of librarianship which have various names relating to information). Other requirements we have identified should be integrable into existing programs with only minor modifications or expansions. Yet others may require complete design and development of courses, or restructuring of existing courses or programs. However, it is not our purpose here to discuss how the various requirements identified are or should be converted into components of educational programs. That is the prerogative of individual institutions. Instead, we discuss the requirements themselves.

One of the major requirements that emerges is the need for subject knowledge, that is, knowledge of specific subject areas usually to the Bachelor's degree level. This requirement is becoming increasingly important as more librarians and information professionals are performing functions which involve direct interaction with end users. As this interaction increases and as users expect increasingly sophisticated services, this subject knowledge requirement will become increasingly important. In conducting interviews in many different types of organizations employing librarians and information professionals, the need for people with specific subject backgrounds (particularly in scientific and technical disciplines) was expressed repeatedly.

Another requirement considered to be of increasing importance is that relating to the broad-based library and information science knowledge. At the present time, the only source of education relating to such knowledge is formal education programs. Examples of types of knowledge required are knowledge of the structures and organization of information, management of information, and knowledge of information handling technologies, techniques, methods, etc. The acquisition of such knowledge is especially important as librarians and other information professionals move into more responsible and managerial positions. However, this knowledge is also important for professionals, from entry into the profession throughout their careers, as it provides a context for all their professional activities, and as indicated in the validations will become very much more important in the future of all librarians and information professionals.

The knowledge of the information environment and trends occurring within this environment is also increasingly important. Another reason why it is important for librarians and information professionals to acquire such knowledge at the earliest possible time in their professional life is to provide them with the basis for career planning. It is important for all professionals to understand the totality of the profession they have selected and it enables them to determine which area of specialization they wish to develop, or whether they should prefer to become generalists. The amount of knowledge required will vary from individual to individual but all students entering graduate programs should be exposed to an overview of the information environment, its components and interrelationships. As the information environment continues to develop and expand in complexity so will the acquisition of knowledge about this environment and how it is evolving will become increasingly important.

Another controversial requirement relates to the knowledge of the work that will be performed in the workplace and the role of specialization. Our results indicate that many of the competencies required to perform certain functions are transferrable across work settings. Thus, it appears that specialization should be functionally oriented rather than oriented towards the type of organization within which the work is conducted. It is interesting to consider that most courses organized by work setting (i.e., medical librarianship, records management, etc.) must cover all the functions that will be performed in those settings, if they are to prepare professionals to perform well in those settings. It is our contention that specialization by function is the way programs should develop. In so doing, graduates can be prepared to apply their competencies in a wide range of work settings and increasingly in non-library settings, the information employment sector generating the greatest demand at present.

The competencies required by professionals to perform their designated or chosen functions include knowledge about the function (specialization); the services and products that are usually and potentially offered; knowledge of the specific tasks or activities that are required; and knowlledge of the systems, tools, techniques and methods, etc. that pertain to the function. These types of knowledge are generally taught in courses offered in existing programs. However, in addition to these types of knowledge, the librarians and information professionals need to know and understand the expectations that employers will have in terms of performance; the kinds of job responsibilities that will have to be accepted; the working conditions that can be expected. These are often not incorporated into traditional educational programs and should be a part of any professional preparation so that graduates of professional programs are not totally overawed when moving into the workplace.

Furthermore, knowledge of a specialized function and all its associated tools, etc., and of the responsibilities and expectations placed on the professional practitioner needs to be supplemented by knowledge of how to do the work and by development of certain skills in applying the knowledge. For example, reference librarians need to know about the reference function, about methods such as those used to determine user requirements, etc. They need to know that to be effective reference librarians they must interact with users. Learning the techniques of interviewing is important. But they also need to practice conducting interviews. In other words, they need to know about reference work (what it is, etc.), how to perform reference work, and actually to develop the skills to perform reference work successfully. These three types of competencies form the basis for specialization in the profession.

There has been much discussion in the literature of whether skills (typically acquired through training programs) should be included as part of professional education. One frequently used example is that of online searching. Some feel that the training of students in the use of online retrieval systems should not be part of professional education programs, but should be conducted either on the job or else through continuing education programs. This philosophy is overly simplistic. A very important aspect of education is the development of generic skills (i.e., transferrable skills). Certainly we expect all graduates to be able to communicate well, to make decisions, to solve problems, etc. We should also expect graduates to be able to put their knowledge to use. This can only be achieved through skills acquisition and development. Thus, referring to the example used above, online searching should be taught in educational programs. However, this does not mean that these programs should produce experts in the use and searching of every database or vendor system they might expect to come across in the course of their careers. Rather, they should develop their skills sufficiently to make them transferrable, together with the knowledge acquired. This issue of transferability is becoming increasingly important as new information-related professional jobs emerge.

Another set of competencies assumed of entering professionals, but often not specifically addressed in existing progams, relates to the competencies expected of all professionals regardless of the professions they have chosen. These include such competencies as the ability to communicate well in a variety of modes; the ability to manage time effectively; willingness to take or accept responsibility; responsiveness to time constraints, etc. All of these competencies should be developed during the formal education process and the assessments used for graduating students from these programs should take these high level generic competencies into account. Similar in nature are the attitudes considered essential to successful performance. Attitudes are often ignored in formal education, and particularly in assessment. Many consider attitudes to be synonymous with personality traits and, therefore, unteachable. This is not so. Attitudes can be instilled in people, attitudes can be modified, and attitudes can be learned. Educational programs should be presented in such ways as to generate and stimulate the existence of positive and other essential attitudes. Much of the responsibility for attitude development rests on faculty members. The best way to influence attitude is through demonstration and example. Faculty members should continually review their own attitudes toward the profession, themselves and others, and also the way they are perceived by others.

Many competencies required of librarians and information professionals are highly specific to the organizations within which they work. These cannot be acquired through formal education programs. Nevertheless, it is important that librarians and information professionals understand the importance of such competencies so that on entering the workplace they can begin to seek ways of acquiring them.

In times of extensive and rapid change, no single program of education can give students all the competencies they need for successful performance throughout their careers. It is important, therefore, that students understand the need for ongoing and continuous learning. They must be able to learn how to learn. They must be able to evaluate information for themselves, to make decisions and to solve problems. These are competencies not only essential to librarians and information professionals, but to all individuals in order to cope with daily life. However, such competencies cannot be taken for granted since they are so vital to survival. It is the responsibility of all educational programs to ensure that their graduates are capable of coping with a changing world, and of understanding how the competencies they acquire and develop can be utilized.

REQUIREMENTS FOR TRAINING

Training is a process generally associated with the acquisition of skills. As mentioned in the previous section, however, the acquisition of skills is intimately associated with the acquisition of knowledge (especially "how to" knowledge). Two major training requirements for librarians and information professionals have been identified.

The first requirement is the responsibility of the employers of librarians and information professionals and could be considered as orientation training. Such orientation should include the acquisition of knowledge of the organization including its mission, goals and objectives; knowledge of the structure of the organization and the role of the information section within the organization; knowledge of the key programs and individuals within the organization; knowledge of the policies and procedures relevant to the information section; knowledge of the various resources available within the organization, including personnel, equipment, facilities; knowledge of job responsibilities, expected performance and how it will be measured; and so on. Much of this knowledge is imparted to professionals upon entering an organization but those relating more generally to the organization and its interests are not automatically covered. It is important that employers recognize that without this knowledge it is difficult for librarians and information professionals to be truly successful, and the time taken to acquire such knowledge on one's own initiative is not inconsiderable.

The second training requirement complements the training which was considered an essential component of formal education. It involves training related to specific systems, tools, methods and techniques and is acquired within the specific workplace. There, one can complement basic training in the use of online searching with specific training in the use of certain online systems and online databases, for example. As before, it is important that employers recognize that such training may be required as they cannot expect formal education programs to cover every detail of every possible system, method, etc., that any librarian or information professional might encounter.

REQUIREMENTS FOR CONTINUING EDUCATION

It is clear that as a result of the amount of change occurring in the information environment and with the emergence and development of new participants in the information community, continuing education of librarians and information professionals is extremely important. There are, as with training, two major continuing education requirements.

The first requirement relates to the ever-increasing environment and body of knowledge relevant to the information profession. Librarians and information professionals have to cope with new sources of information, and changing formats of sources requiring new methods and techniques for exploiting them. They have to face an ever-changing array of new technologies and devices for processing, storing and accessing information. Not only are the resources of their profession changing, but the communities, individuals and organizations they are serving are changing. Expectations of, and demands placed on, information services are expanding and increasing.

In order to cope with such change, librarians and information professionals must continually update and expand their competencies. They themselves must recognize this need, as must their employers and their respective professional societies.

The second continuing education requirement relates to career progression and the need to upgrade one's competencies accordingly. The main requirement that emerges is for increased management competencies including knowledge of the costs associated with resources; knowledge of resource allocation; knowledge of standards, measures and methods for evaluating personnel; ability to anticipate long-range needs; ability to budget and make projections; ability to optimize the use of information resources. As before, continuing education is the means by which developing professionals acquire new competencies. The recognition and awareness of career development needs is the responsibility of the professionals, their employers and the professional societies.

REQUIREMENTS FOR CAREER DEVELOPMENT AND PLANNING

We include this section because much of the responsibility for continued successful performance of librarians and information professionals rests with the professionals themselves. Earlier, we stressed the importance of instilling in professionals the necessary attitudes for successful performance. These attitudes include a respect for the profession, desire to work to the best of one's ability, willingness to learn, etc. If professionals possess such attitudes, they will progress in their careers. However, it is important that career development and the acquisition of new competencies be conducted in a coordinated fashion rather than haphazardly.

Earlier we mentioned the increasing trend toward specialization. This trend increases the need for career planning so that the individual can select from among the many continuing education offerings available. Of equal importance to career planning and development is a thorough understanding of what opportunities are available, of how competencies originally acquired for one purpose may be transferable to other situations. It is for this reason that the basic library and information science competencies and competencies relating to the overall information environment were considered an essential part of the formal education of librarians and information professionals.

Librarians and information professionals, above all other professionals, should be best able to plan and develop their careers. This is because of their basic competence in finding and retrieving information. All they require is the appropriate mind-set (attitude) to develop. Many examples exist of librarians and information professionals who have moved from very traditional positions to senior executive positions as a result of their basic library and information science competencies. For example, we know of a librarian working for a high technology organization. The librarian performed reference services initially, but gradually was asked to prepare brief summaries of materials located. This was later extended to preparing papers, proposals, etc. The librarian is now Vice President for Research and Development. This may not seem too surprising until we mention that the librarian has a background in English Literature, and is now leading research and development programs relating to highly sophisticated technological systems. What contributed to this individual's success was the basic library and information science education (including principles of information structure, organization, retrieval and management), the skills to locate information and to extract basic elements of a text and summarize it, and a willing attitude to try. This individual has been so successful that the librarian to research and development career path has now been firmly established within the organization.

NEW DIRECTIONS FOR THE FUTURE

In reviewing the competencies that were considered either essential or desirable today, against those that would become more or less important in the future, some interesting trends emerged. All of the very basic and generic competencies which were generally only considered essential for the management function, were unanimously designated as increasing in importance over time. Furthermore, competencies relating to new technologies and to management, administrative and supervisory activities were also expected to become more important.

There is a strong indication from the validations that the librarian and information professional of the future will be much more outgoing and proactive, as evidenced by the perceived increasing importance in having a broad view of the profession; in anticipating needs, both of the information user as well as the organization within which one works; in having a knowledge of ongoing research in the field; in the development of interaction skills; and in a knowledge of career opportunities. This is parallel to recent trends in the provision of library and information services based on an active identification of actual, projected and potential information needs of various user communities.

How can the educational community respond to the changing needs and characteristics of the information profession and the individuals within it, beyond changes in curriculum content? There appear to be several areas where change could occur with varying level of input from educators.

The first area relates to the selection of individuals into formal programs of library and information science education. Naturally, different schools have different selection criteria and policies for accepting students into programs, but generally the process is a fairly traditional one with schools advertising in catalogs, etc. According to our interviews, not enough people with the needed backgrounds are being attracted into the profession. For example, a need for individuals with a scientific background as well as the library and information science competencies was frequently expressed. Such individuals might be attracted into schools of library and information science if there were more contact between the schools/departments, etc. Such contact could be minimal, through the advertising of scientific information career opportunities, or through presentations to students; or more extensive, perhaps through offering information-related courses to students in other departments. Such courses could be offered to freshmen, many of whom are still uncertain as to what their careers will be, or to seniors who are pursuing career options fairly vigorously. Note that the above discussion applies to any academic discipline and not just the sciences.

The attraction of potential candidates for the information profession need not be initiated at the higher education level. The information profession should be included as an option in career guidance sessions at the high school level also. Faculty members of library and information science schools could talk to high school groups and should strengthen links with local career guidance counsellors. These linkages could also be strengthened at the national association level.

At a time when the numbers of librarians and information professionals in the workforce is increasing (in absolute numbers), enrollments in library and information science programs are staying approximately level. The situation can only be remedied by coordinated, concerted efforts to "drum up business" by presenting the profession as an exciting, forward-moving opportunity that epitomizes the challenges and the opportunities of the Information Age.

At the other end of the formal education process is placement. Here is another area where change could occur. Inasmuch as the information environment is changing and new types of information service organizations are evolving, so the numbers and types of librarian and information professional positions are changing. Placement personnel should be kept up-to-date about changes in librarian and information professional opportunities and about the transferability of traditional information-related competencies to non-traditional work settings. Again, this could be achieved by faculty at the specific campus level, or at the national association level.

A final area where change can occur is the assessment and evaluation process. Most formal educational programs (except perhaps in teacher education) use traditional forms of assessment. These have been evolving over the years but perhaps are themselves in need of assessment and evaluation. With the focus of competency attainment on the demonstration of observable behaviors relevant to the workplace, the assessment methods generally reflect the same focus. However, this raises several serious issues.

The first is the question of whether or not professional education prepares one to perform specific jobs, or gives one the means to handle a variety of job situations. This is essentially the professional versus vocational education dichotomy. In the field of library and information science this dichotomy is exacerbated by the fact that librarianship was, for many years, considered a vocation and entry into the field was through apprenticeship.

A second major issue related to the assessment of competency attainment is the cost to develop and implement more behavioral assessment methods such as live "simulations," laboratory demonstrations, etc. One way to avoid setting up special-purpose testing environments is to have the students conduct practicums in information service organizations and then send assessors to observe their performance. Unfortunately this increases the cost over traditional assessment methods, often extends the time it takes to graduate, and requires a group of willing host sites (many of which often find the support of student practicums to be overly costly for the benefits derived).

In spite of the obvious problems with new competency-based assessment methods, it is probably still time for an investigation of existing methods. Some additional competency-related factors could probably be incorporated into existing practices with a minimum of disruption and effort. For example, oral communications competencies could be evaluated in the standard classroom environment.

Essentially, changes could be made at any point in the overall educational process. Some participants are currently effecting those changes through individual initiatives. However, unless there is a continuous coordinated effort on the part of the majority of participants in the librarian and information professional education community to enhance and project a positive, proactive image of the profession and its leading role in the Information Age, we cannot expect to see an appreciable improvement in the competence of librarians and information professionals.

In summary, it is the responsibility of all participants in the educational process to ensure that librarians and information professionals acquire the necessary competencies to perform their work. Although, traditionally, this has been considered the domain of educators and, occasionally, professional societies, both employers and individual professionals must recognize their respective responsibilities towards the development and enhancement of the profession by recognizing the importance of competency development for professionals. Employers should not raise their expectations to unattainable limits and should recognize the importance of knowledge acquired on-the-job. Individuals must recognize the need to continue to learn throughout one's professional career in order to advance professionally. Furthermore, individuals should be aware that they will often have to take the initiative in professional development themselves as there are rarely formal requirements for continuing education and training.

Knowledge of the totality of the information profession and the environment within which it resides is important for all librarians and other information professionals (practitioners, educators and researchers) and must be kept up to date so that they can keep pace with changes and strive for optimum rather than mediocre performance. Knowledge of prevailing trends affecting the profession will enable professionals to plan ahead in developing or even changing specializations. Related to this knowledge is an understanding of the importance of specific competencies, and of specific kinds of competencies (e.g., attitudes, and the transferability of competencies) to foster a long-term professional perspective.

No single program of education can provide the individual with all the competencies that are likely to be required through one's professional career. Thus it is important to foster a desire for growth, a knowledge of how to learn, decision making and critical thinking skills so that one can determine the most appropriate career path and form of competency acquisition within existing constraints. Individuals need to maintain a certain flexibility and open-mindedness to take advantage of alternative career opportunities as they arise.

Finally, we stress the need to continue the process of communication among educators, employers, professional societies and individual professionals to continue to review existing competency requirements, identify new requirements and to modify education and training programs as appropriate. As mentioned earlier, the process is a continuous one: this project is only a start and not the end point.

APPENDIX 1

LITERATURE REVIEW

LITERATURE REVIEW

In his annual report for 1869, Mr. Justin Winsor, superintendent of the Boston Public Library, spoke of the need for schools to train practicing librarians but reflected that the demand might perhaps never warrant their establishment. Despite Mr. Winsor's pessimism, Melvil Dewey in 1887 successfully opened the first school for librarians, the School of Library Economy at Columbia College. From these beginnings, we have, nearly 100 years later, 67 library schools with accredited graduate level programs in library and information science education, and still another 25 library schools with unaccredited graduate level programs [Journal of Library Education, 1984]. In addition to these programs, there are also undergraduate level programs associated with some of these schools, numerous continuing education programs sponsored not only by the library schools but also by federal, state and local government agencies as well as the private sector, and on-the-job training programs. These schools, agencies and programs still educate and train many practicing librarians in the tradition of the first program at Columbia. However, they also increasingly provide higher education and continuing education to librarians and information professionals who find employment outside of the library environment. To some extent, curricula have kept pace with changing educational requirements of the library and non-library working environment. However, this response has been a reactive rather than proactive one. While a look to the future is called for, many of the current unresolved issues in library education are rooted in its history of development in this country.

In reviewing the evolution of library education in the U.S., certain key events are generally recognized as marking a transition from one phase of development into another. Three phases have been identified between the late 1800's and the early 1970's [Kesting, 1972]. To this a fourth should also be added. The first phase, lasting until the establishment of the first formal library education program in 1887, was characterized by training in specific library skills through apprenticeship in a library institution. Few books were available on the subject, and only in 1876 was the American Library Association (ALA) established as a forum for the exchange of ideas among librarians.

The second phase, beginning with the establishment of Dewey's school at Columbia College, is characterized by the fairly rapid development of other library schools and library education programs. In the late 1800's these included the School of Library Science at Pratt Institute (1890), a summer school program at Amherst College (1891), and practical training programs at two technical institutes, Drexel in Philadelphia (1892) and Armour in Chicago (1892, later transferred to the University of Illinois in 1897). By 1920, there were some 16 such programs in either academic or public library environments, variously awarding certificates, Bachelor's degrees or Master's degrees upon completion. In all of these programs, courses were still geared toward training students in specific skills to prepare them for the application of those skills in library environments. The courses which thus received the greatest emphasis were cataloging, book selection, reference work and classification.

The rapid increase in the number of library education programs to some extent paralleled a growth in the number of libraries during the early part of this century. However, this growth was followed by a third phase in which library education was transformed from a kind of "systematic apprenticeship" to professional education. Concerns for quality, accreditation, broader educational objectives and standardization were raised during this phase and formalized responses devised.

During the period in which early library education programs were developing, there was some concern for identifying and ensuring standards of instruction, entrance requirements and curricula to which such programs would conform. As early as 1900 it was suggested that ALA assume this role and become an accrediting agency. In 1915 the Association of American Library Schools was formed and recognized by ALA. Through its specified requirements for membership it became recognized, in effect, as an informal accrediting agency. However, it was not until the completion of the landmark Williamson report in 1923 that a Board of Education for Librarianship was formed to accredit library schools according to standards adopted by ALA. Such standards were first formally adopted in 1925 following the recommendations of the Williamson report. The report further influenced the future course of library education by distinguishing between professional and clerical library work and education, and advocating an emphasis for library schools on the professional, stressing the need for continuing education, and recommending a system for certification of librarians.

In the late 1920's, another development of considerable significance to library education was the establishment of the Graduate Library School at the University of Chicago and its unique emphasis on research in the field of librarianship. Through its doctoral program (the only one in the field until the 1940's), the application of research methods of the social sciences and other disciplines to the problems of libraries and librarianship, and the recognition of the desirability of developing a body of theoretical knowledge relevant to librarianship, a new field of library _science_ emerged as distinct from library _service._

Although the concerns of this third phase in the development of library education continue up to the present, with debates on professionalism, revisions of standards, re-accreditation and so forth, a fourth phase of development has been underway for the past twenty years or so, characterized by the increasing attempts of library education programs to respond to the demands of what is now recognized as an information economy. As Taylor points out, what has happened is that libraries are now part of a larger information infrastructure [Taylor, "Reminiscing About the Future", 1979]. The information environment in which the library exists is changing — exploding, to use a common adjective—to the extent that the portion of "messages" (e.g., carried in books as well as non-print media) handled by libraries has diminished relative to the increased load handled elsewhere. New technologies, improved publishing and dissemination mechanisms, other media have all played a part in this explosion. At the same time, some of these new technologies and media have been gradually incorporated into information handling procedures to revolutionize the methods traditionally used by libraries.

As the information age has developed, and with it, the adoption of new technologies and techniques for information handling by librarians, library education programs have responded in a number of ways. One of these concerns the content of library education. Despite some of the changes over the century concerning standards, professionalism, and library science research, the content of education for traditional librarianship changed little over this period. In fact, the core curriculum concept which became firmly established in the 1960's and is still at the center of most library education programs, focuses on instruction in the basics of administration, bibliography and reference, selection, and cataloging/ classification, the same basics taught at the turn of the century.

To this core curriculum, however, library education programs in the 1970's and 1980's have added a wide range of course offerings drawn from the allied field of information science, most often pertaining to the use of technology in libraries, information retrieval, information management, and information system design. In adopting such courses, many academic library education programs have also adopted a name change, to include library and information science, information management or information studies. By 1982, 37 of the then 70 accredited academic programs had included "information" in their names [Harter, 1982]. Some have even gone further to more fully embrace an information science curriculum, sometimes offered in parallel to a curriculum designed for library education. To some extent, this duality reflects and perpetuates the parallel development of library studies/library science and information science in the U.S. over the past 50 years along with the characteristic distinction in the utilization of computer and other technologies which has divided the two disciplines until recent years. Whether library science and information science are even now converging is a topic of particular interest which elicits widely divergent opinions [Machlup and Mansfield, Study of Information, 1983].

A second type of development in library education in the "information age" concerns the location and duration of education. While the debate over the length of time required for graduate level study in the library field is not new, the body of even basic knowledge and skills has expanded, not to mention the growing number of options for areas of

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specialization. Some academic Master's degree programs in library and information science education have expanded into two-year programs, though whether this should be the standard requirement is still controversial. A related need for continuing education was given particular emphasis in the 1970's. In 1975, the National Commission on Libraries and Information Science proposed a strengthened national program of library and information service backed by redefinition and modernization of basic and continuing education programs for librarians and other information personnel. Around this same time, considerable work was done to establish a Continuing Library Education Network and Exchange (CLENE) as a mechanism for coordinating a diverse range of continuing education opportunities, maintaining standards, and providing recognition for completion of continuing education courses and seminars. Today, a wide range of continuing education programs is offered not only by the academic library schools, but also by national and local level professional associations, all levels of government, and private sector seminars and workshops.

Future directions for change have, of course, been proposed. Most are attempting to come to grips with the changing role of the library, and the library and information professional, in our society. Some proposed changes may indirectly influence the nature of academic library education programs, such as Saracevik's proposal for independent degree programs in information science [Saracevik, 1983] rather than the current integration of information science curricula in library science, computer science and management programs. Others, such as Taylor, more directly address the need to readjust our view of the information profession, recommending a shift away from the traditional assumption that librarians and hence their professional education are institution bound. Only by so doing can a new educational framework for the information professional be developed.

COMPETENCE AND EDUCATION

Competency-based education (CBE) is a movement whose evolution can be traced through teacher education, undergraduate college programs, general education, programs in secondary schools, and vocational and technical education at the secondary level. A review of post-secondary CBE programs identified three emerging themes which are a reflection of the underlying basis for CBE. They are:

(1) The goals of education should be conceptualized as effective actions or performance in some later role, rather than inferred cognitive states such as "knowledge" or "maturity."

(2) Educational goals should be described in language that is as explicit as possible, broken down as far as possible into component outcomes which lend themselves to measurement.

(3) Student achievement should be assessed in terms of the ability to demonstrate "the behavior itself" (i.e., performance in the later role for which the students are being educated).

Competency-based education first developed as a conceptual framework or model for programs in the teaching field. Legislatures required that schools demonstrate their effectiveness in terms of student learning outcomes, especially in basic skills (e.g., library skills). Critics proposed that teacher education should be firmly grounded in knowledge of the demands of actual classroom practice and prerequisites of effective performance, thus giving rise to the CBE movement.

State education departments and legislatures across the country began exploring, advocating or mandating competency-based teacher education (CBTE) sometimes called performance-based teacher education (PBTE) [Schmieder, 1974]. The prevalent form of teacher certification was the "program approval method" which was very inexpensive to administer. Under this system, anyone who completed an accredited teacher training program was automatically certified by the state. A desire to maintain this form of approval system was instrumental in the mandating of CBTE. It was proposed that the program approval system was justifiable only if competent novices were graduated by schools of education.

Optimism ran high in the early days of CBTE but in 1974 Krathwohl wrote:

> "One can predict that performance-based teacher education (PBTE) is certain to fail to reach its ultimate objective if it continues on its present course. This failure will be caused by the almost complete lack of attention given to the assessment of teaching competencies, a core concept of PBTE." (Krathwohl, 1974]

In response Medley, et al., wrote:

> "We suspect that this neglect of the assessment problem is not entirely the result of conflicting demands on program developers' time. Our contacts with these harried individuals reveal that they have a strong reluctance to tackle these problems because of feelings of inadequacy arising from the lack of knowledge of adequate approaches to solutions." [Medley, et al., 1975]

Competency-based vocational education goes far beyond specificity and explicitness about educational objectives. Many programs are constructing or rebuilding their curricula based on task analyses of jobs.

While information from task analyses can be useful in inferring specific requirements as far as knowledge and skills are concerned, it gives little on the worker characteristics which underlie performance on the tasks and is not useful for inferring the cause of, or explanations for, behavior. Task analyses have been criticized as being inadequate for operationally defining generic competencies (see next page for definition). Valued behaviors (such as punctuality) are usually not analyzed in terms of necessary attitudes and motivation patterns that lead to this kind of behavior. Also, the supply of people with adequate theoretical understanding and conceptual skills to draw such inferences and develop training programs for these competencies are in extremely short supply [Tyler in Huff, 1980]. As a result, the "affective" domain and complex cognitive skills are given little attention in instructional programs.

One of the most promising aspects of CBE is the emphasis on skill clusters applicable to several job or occupational areas. Also, the cluster concept enables guidance personnel to individually tailor student's in-school and work-study programs. To improve capability in this area, a major study on transferrable skills is underway at the National Center for Research on Vocational Education in Columbus, Ohio.

A generalized process for competency-based assessment and curriculum development was proposed by Huff [Huff, et al., 1980] and displayed in Figure 1-1. This process bears a striking resemblance to the planning process we proposed to use. The first step in this educationoriented process is to define the institutional mission. This is usually achieved by setting goals. The next step is to identify the job or roles of interest to that mission and its goals. The third step (and the area that this project addresses) is the determination of required competencies.

In identifying required competencies (both current and potential) it is important to consider the nature of competencies.

There are two basic types of competence:

(1) Specific Competencies — which relate to individual disciplines, such as cataloging, on-line retrieval, and reference skills in library and information science.

(2) Generic Competencies — which are applicable to any discipline, such as management and administrative skills.

APPROACHES TO COMPETENCY-BASED EDUCATION

During the past decade, competency-based education (CBE) programs have been implemented at a variety of levels within the American educational system. However, if one were to ask of educators involved with these programs exactly what competency-based education is, several quite different responses would be obtained. As Huff has noted, "If one examines all educational institutions or programs that call themselves 'competency based' there is no uniformity with regard to any of these elements. There is, for example, no uniformity with regard to educational goals; curriculum, institutional environment and pedagogical techniques; ways in which students are evaluated; or rules and procedures followed....Saying that a program is 'competency based' tells us no more about what the program might look like than saying a program is 'traditional.'" [Nickse, 1981.]

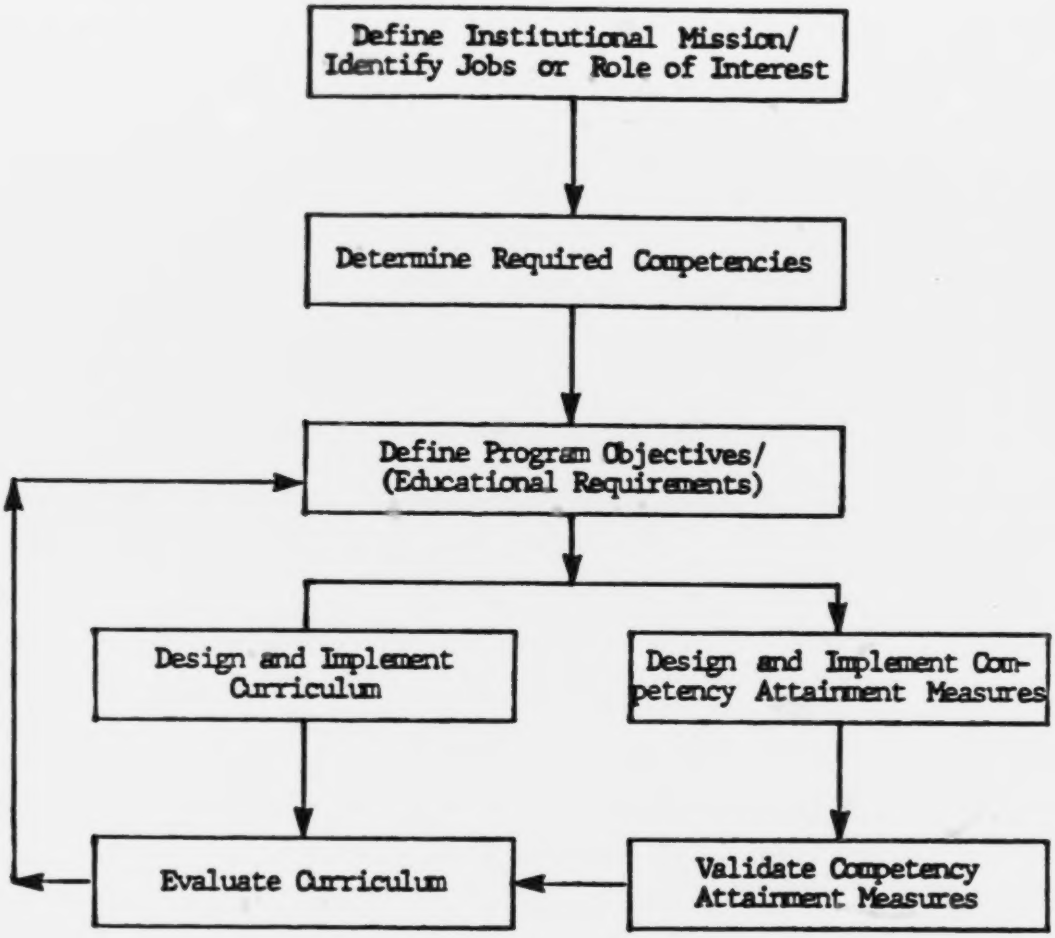
Define Institutional Mission/
Identify Jobs or Role of Interest
Determine Required Competencies
Define Program Objectives/
(Educational Requirements)
Design and Implement
Curriculum
Design and Implement Competency Attainment Measures
Evaluate Curriculum
Validate Competency
Attainment Measures

Figure 1-1 Competency-Based Assessment and Program Development Process

The variety of educational levels at which competency based education has been applied illustrates the lack of uniformity which Huff describes. One of the largest areas of development of CBE programs has been at the K-12 level, partly as a outgrowth of concern for teacher accountability and maintaining educational standards. Competency-based teacher education and minimum competency testing have been particularly important outgrowths of the CBE movement at this level. The vocational training area as a whole has played an important role in the development of step-by-step methods for developing and implementing CBE programs [Blank, 1982; Maxwell and West, 1980], although the emphasis of vocational-technical programs on task analysis is treated with caution by those who take a more holistic approach toward identification of competencies.

In post-secondary education, support for the development of a number of CBE programs was provided in the early 1970's by a program of the Department of Health, Education and Welfare, the Fund for the Improvement of Post-secondary Education (FIPSE), including both liberal arts and professional training programs [Grant, et al., 1979]. Among the latter, though not necessarily funded by FIPSE, the most frequently documented programs are those of Antioch Law School, the College of Human Services in New York [Gamson in Grant, et al., 1979], Minnesota's College of Pharmacology [Nickse, 1981; Huff, et al., 1980], and Southern Illinois Medical School. In-service training programs have also to a limited extent looked into using competency-based education methods, with programs developed by Bell Systems and the U.S. Air Force regarded as among the most innovative and successful [Dunn and Mitchell, 1981]. Finally, at the level of adult education, CBE has been used particularly to promote continuous learning and the development of "life skills."

In an effort to identify at least some elements of a common definition of CBE, Grant and his colleagues, in evaluating some of the FIPSE-funded programs, suggested that "competence-based education tends to be a form of education that derives a curriculum from an analysis of a prospective or actual role in modern society, and that attempts to certify progress on the basis of demonstrated performance in some or all aspects of that role" [Grant, et al., 1979]. What that curriculum presumably teaches is a particular competence or a set of competencies — again variously defined as anything from "a task performed to a certain standard" [Maxwell, and West, 1980] to "a generic knowledge, skill, trait, self-schema or motive of a person that is causally related to effective behavior referenced to external performance criteria" [Klemp in Pottinger, 1979]. In all cases, "performance" is stressed as the means by which competence is demonstrated and assessed; an alternate term which has often been used as an equivalent to competency-based education is, in fact, performance-based education.

However, despite the general emphasis on performance, there is little clear agreement on exactly what aspects of performance a determination of competence is based upon. For those in vocational education, the emphasis is strongly upon mastery of essential job skills [e.g., Blank, 1982], arguing that it is the application of a given skill to the performance of a task for which a consumer is paying. Knowledge and attitudes are seen as supporting those skills, but not as being directly measurable in a determination of competence. A general emphasis on observable behaviors is often referred to as a behavioral objectives approach. This approach has, however, come under strong criticism by those who maintain that when carried to an extreme, it results in "lists of countless skills connected to particular kinds of jobs," assuming that "the acquisition of micro-skills adds up in some fashion to overall competence" [Pottinger, 1979]. Hence, some educators argue that competency may be based on the characteristics of an individual that underlie effective performance, such as knowledge, skills, traits, a self image or a motive [Klemp, 1980]; others [e.g., Pottinger, 1979] raise the importance of interpersonal and environmental variables in influencing behavior. Klemp in particular emphasizes that particular competencies do not exist in isolation from each other, but that effective performance is based upon the integration of several competencies. Further, in actual performance, various combinations of competencies may co-occur (in what Klemp calls a competency model), producing functionally equivalent outcomes or performance.

Two other definitional problems also arise which deserve mention. First, the problem of ascertaining whether students need to manifest minimal or optimal competency is often discussed, including the issue of what constitutes a given level of competence. And second, various CBE programs have discovered a need to formulate both generic and specific competencies — i.e., those which are common to a variety of performance situations, as well as those that are specific to a particular job or task.

In sum, when examining the components and methods of implementing CBE programs, or in simply identifying a set of educational goals, "the meaning attached to the concept of competence determines all else. If competence is defined as acquiring a set of facts or mastery of particular skills, a CBE program will be very different from one in which competency is regarded as the ability to function in a job or life role" [Schalock in Nickse, 1981]. Bearing this in mind, a number of suggested methods for identifying, describing, validating and assessing competencies are reviewed in further detail below, followed by several examples of competency identification efforts and incorporation of identified competencies into CBE programs in the library and information science field.

COMPETENCY IDENTIFICATION, VALIDATION & ASSESSMENT

Competency Identification

A number of studies on competency-based education offer guidelines for the development of a CBE program. Those suggested by Huff are particularly interesting as they begin, not with methods for identifying competencies, but with an emphasis on first defining the institutional mission and/or educational goals of a particular program. Too often, Huff asserts, CBE programs proceed on the basis of a priori or assumed goals rather than demonstrated goals which are clearly relevant to the requirements of later job or life roles. The clarification of such goals is held to be equally important for all programs, whether a four-year liberal arts degree or a four-week management training course.

Various methods have been utilized and recommended for the identification of individual competencies, one of which is the use of panels comprised of experts or practitioners in a given field to draw up lists of required competencies in that field, usually based on identification of those competencies which effective people possess. While often used and accepted, Pottinger terms this "the most popular and dangerous technique," [Pottinger, 1979] although he offers little further explanation. By far one of the more explicitly detailed methods of determining competencies has been developed by vocational education programs — task analysis. Again, this may be variously defined and implemented, but the basic method is to identify a job and then break it down into its component parts. Davies [1973] calls the three elements of task analysis topic, job and skill analysis, of which the first is concerned with the identification of intellectual tasks, the second with psycho-motor skills, and the third with how the job is accomplished. Maxwell [Maxwell and West, 1980] also outlines a number of steps involved in task analysis, based on a distinction between duties (major work functions) and tasks (actual units of work). Both duty and task listings are drawn up and refined by an advisory committee, followed by task detailing or specification of exactly what steps and knowledge an individual needs to be taught to perform a task successfully. Johnson [1977] also suggests observing workers on the job and tabulating tasks, and collecting and analyzing job descriptions. As might be expected from the criticisms noted above of task-oriented competency development, task analysis has also been criticized as yielding only lists of minimal competencies or identification of threshold skills rather than optimal competencies associated with outstanding performance. Several authors do note the practice of more than one approach in identifying competencies — for example, the University of Minnesota Pharmacology program has used task analysis to identify threshold peformance and panels to identify aspects of good performance. A thematic-analytic approach used by the Navy and AMA programs is also noted by Huff [Huff, et al., 1980]. This approach considers competencies to be human characteristics that underlie effective peformance rather than the observable behaviors themselves; hence the emphasis is on contrasting the actions, reactions, thoughts and attitudes of competent or outstanding performers in the same job to "discern competency themes that organize behavior in a variety of situations." Such competencies tend to be general and optimal in nature, rather than specific and/or minimal.

Competency Validation

Once a set of competencies has been identified, it is recommended that those competencies also be validated, or reviewed to determine that each of those selected for final inclusion in a program is indeed essential to effective performance in the profession. Several processes for validation have been identified, three of which are evaluated by Johnson [1977]. Use of experts is again suggested as a means of validating selected competencies, in this instance often a wider sampling of specialists are asked to prioritize competencies through a questionnaire/survey. Results of such a survey can then be used to rank order the original competency listing and sort out those competencies not deemed to be essential. A second method particularly suited to observable behaviors involves measurement of the extent to which a given competency is actually required (performed) on the job and the quality of any resulting products. The final method or model identified by Johnson is termed logical analysis, involving "reflective thinking, consulting, weighing evidence and inference judgements" and best suited to situations where competencies are defined as complex constructs rather than objective behavior. In assessing the three models, Johnson suggests that each has its own limitations — reliance on experts runs the risk of validation based on what the vocation or profession is known to be rather than what it should be; product assessment is only useful where competencies can be examined one at a time as particular behaviors; logical analysis is clearly linked to a particular understanding of competency. In sum, the method selected must be related to program definition and objectives.

Assessment

One of the major concerns in the literature on competency-based education is with the assessment of competency attainment. To date, many of the tests and measures used by CBE programs to evaluate student progress are identical to those used in non-CBE programs. Daniel and Ely [1977] identify eight strategies for assessing competency attainment ranging from evaluation of actual job performance and/or performance in a controlled situation, to the familiar portfolios, oral presentations and paper and pencil tests. However, importantly, they make a distinction between those methods which are measures of actual performance, and those tests, papers, and presentations which are really only indicators of competency.

In fact, much of the literature on competency assessment is less concerned with measures currently in use, which tend to be based on traditional assessment techniques, and more concerned with the considerations which need to be kept in mind in developing new techniques uniquely suited to competency assessment. Validity again arises in evaluating assessment measures and tests — does a given test actually measure what it is intended to? Several validity measures have been developed for CBE programs. If a competence measure appears to measure what it is intended to measure, then it may be considered face valid. If on careful review a test seems to sample and represent the domain it is intended to measure then it may be considered content valid. For example, if a competence measure is intended to assess whether a person has knowledge required for a job, it should measure an appropriate sample of topics in that knowledge base. If a measure is designed to determine whether an individual will respond competently to circumstances in a job, then the measure should include a representative subset of situations for which a certain response is required for effective performance. Construct validity is also used to judge a measure's ability to test and measure particular attributes of the testee. In this case the results of a test are compared with the results of other tests - for agreement or predictable disagreement. The most demanding and informative form of validation is criterion-related validity and is established by statistically correlating performance on the measure with later performance (criterion) which is presumed to be influenced by or related to the competence being measured. This is particularly important for CBE to determine whether a measure of educational competence has demonstrated relevance to performance later in life. Here, the issue is not whether the measure is relevant, but the basis for the claim and kind of evidence brought forward to support it. There are typically two ways to determine evidence to support the belief that education measures are relevant to later life:

(1) either examine whether people who are more effective in their careers or in life perform better on the measures than their less effective counterparts (concurrent validity) or,

(2) see the extent to which students who score higher on a given measure or set of measures go on to be more effective in achieving work or other life outcomes than students who scored lower on the same measures (predictive validity).

Among the various types of recognized validity, the predictive validity of an assessment technique raises particular problems for competency assessment. Can a given technique actually predict successful or effective performance? Klemp [1980] and Pottinger [1979] have expressed strong caution against placing too much emphasis on correlation and confusing it with causality, noting that it is too often assumed that high academic achievement as determined by high test scores is predictive of effective job performance. Pottinger carries this cautionary note into a discussion of the possible contribution by the field of minimum competency testing to the area of professional licensing, encouraging the identification and assessment of competencies rather than reliance upon academic credentials. Klemp in turn develops his concept of the competency model as discussed earlier to include associated assessment techniques which measure more than one competency at a time.

Among other assessment considerations, Huff [Huff, et al., 1980] points to the need for measures which are capable of showing change over time, or over the course of an educational program. Goldsmith [1979] notes the problem of cultural bias in the assessment process. Several studies of actual programs [e.g., Eschenbrenner, et al., 1978; Peterson and Stakenas, 1981] have raised the issue of the cost of assessment techniques, both in terms of time and money. Unfortunately, those measures which are suggested as being well suited to competency assessment are costly on both counts. Daniel and Ely [1977] offer a particular model for cost evaluation of given assessment techniques, and test it using data collected from instructors involved in the competency-based school library media professionals program at Syracuse University.

TASK ANALYSES AND COMPETENCY IDENTIFICATION IN LIBRARY AND INFORMATION SCIENCE

In the field of library and information science, competency-based education programs have been most widely implemented in training school library media specialists, perhaps as an outgrowth of the competency-based teacher training movement, although some attention has been given to identifying competencies for public librarians and using competency-based testing for certification of medical librarians. A number of large-scale studies have also involved task analysis of the entire profession as well as selected sub-fields, although the primary purpose of such analyses has often been for job restructuring and job description, rather than a basis for identifying competencies.

Some task analysis activities have already been performed in the library and information professions. One of the first job-analysis studies was started back in 1924 in an attempt to apply research findings to library education program development [Charters, 1925]. The objective of the study was to identify the tasks librarians perform in various operations and, from these data, a series of library school tests were prepared.

In developing a survey of education needs in librarianship at the post-master's level, Kortendic and Stone [1970] used the task-analysis approach to determine curriculum needs at this level. The basic focus of the research was curriculum development to equip middle- and upper-level personnel in libraries for a changing field. The major conclusion of the study was that the development of well-defined, job-relevant objectives based on the individual's needs for effective job performance, in curriculum development should receive primary emphasis.

Recently, the Medical Library Association voted to adopt new standards for certification of health science librarians which rely on competency-based examinations. The first step in the development of the examination is the identification of basic tasks performed.

In reviewing some of the more recent projects, mention should be made of the School Library Manpower Project, begun in 1968 under the sponsorship of the American Association of School Librarians. Conceived in several phases, Phase I [American Association of School Librarians, 1977; American Library Association, _School Library Manpower Project_, 1970] focused on a task analysis of school library media center personnel, while Phase II sought to identify competency-based job functions and task statements for those personnel, resulting in the _Behavioral Requirements Analysis Check- list_ (BRAC) of 700 tasks [Case, 1976]. Another analysis conducted under the National Education Association's Jobs in Instructional

Media Study (JIMS) resulted in identification of competencies which were adapted by the Association for Educational Communications and Technology Association for inclusion with their guidelines for certification [Galey and Grady, 1977].

At the state level, the Illinois Task Analysis project is frequently discussed in the literature. Also conducted in phases, between 1969 and 1974, the project began with a functional task analysis [Canelas, 1971; Social and Educational Research and Development, Inc. 1970] conducted in 18 representative Illinois libraries (university, public, state, special, school) through interviews with 116 individuals at sampled levels of employment. One thousand, six hundred and fifteen tasks were ultimately identified and then rated according to 15 scales using a methodology developed by the Department of Labor. In Phase II [Ricking, 1971], selected tasks were reviewed by consultants as relevant to particular categories of library personnel in public, and academic libraries and school library media centers. A handbook produced in Phase III [Ricking and Booth, 1972] summarized the methodology and listed the tasks as a basis for educational planning and development of in-service programs. Also performed at the state level and conducted in phases, the Library Selection Project [Selection Consulting Center, 1977] involved a job analysis of entry-level librarian positions in the California State Library and thirteen California public libraries. The study was "...an effort to provide technical and legal guidance to the participating libraries with respect to their employee selection and promotional practices." Minimum qualifications for entry-level professional librarian positions were also reviewed. Included in the Phase I report as an appendix is a finalized list of required entry-level tasks.

Finally, at a national level, the U.S. Department of Labor has produced a task analysis inventory [Wesson, 1980] which includes "work activities responsibilities, educational courses, machines, tools, equipment and work aids used and the products produced or rendered" in several designated areas, including "library work." Tasks are listed under general verb headings (e.g., "prepares"; "recommends") and are neither broken down by professional nor operational level.

In each of these cases, the emphasis has been upon identification of tasks, with sometimes a subsequent effort to translate task performance into statements of competency requirements. However, the initial objective of the projects was not to tie the competency requirements directly to specific instructional CBE programs.

Perhaps the best documented CBE project development is that of Daniel and Ely [1977] to develop CBE programs for school library media professionals at Syracuse University. Using a consortium approach involving administrators, classroom teachers, media specialists, faculty and students, four tasks were carried out: (1) to identify the roles of a media specialist; (2) to identify and agree upon competencies required to assume that role; (3) to develop an educational and administrative package to translate those competencies into a program; and (4) to organize a framework for evaluating and modifying the program. Following completion of (1), participants then identified and prioritized ten competencies for each role; these were subsequently refined in discussion groups assigned to each role, and then circulated for outside validation via a questionnaire. Tasks three and four were each discussed at separate meetings of the participants. Major problems which arose during the process are identified, including difficulty in agreeing upon required levels of mastery for each competency. A course-by-competency matrix was also developed, along with criteria for admission and evaluation.

For a slightly different purpose Mahmoodi [1978] used a similar process of identifying the competencies of public services librarians in public libraries through a selected panel, and validation by a questionnaire circulated to professionals in the field. Some 53 competencies (defined as knowledge, attitudes and skills) are identified and organized into five performance areas. Interestingly, each competency is rated according to how important it is to both current practice and ideal practice, thus overcoming Johnson's criticism as discussed earlier that validation by experts too often considered only current practice. Unlike the previous study, however, Mahmoodi's is conducted primarly as a research project, not for incorporation into a particular instructional program.

In looking at these efforts in the library and information field, two further points which are made in the literature deserve mention. To return to Huff's assessment of CBE programs, she makes a particular point of the fact that the implementaton of a CBE program requires major institutional intervention. Where CBE programs are introduced in transitional institutions, there are built-in obstacles to overcome. But, to be successful, CBE programs cannot simply involve new labels attached to familiar ways of doing things; they involve a new development process and new ways of thinking.

Secondly, several educational researchers, as noted earlier, have called for a careful look at the behavior behind effective performance, not simply the performance itself. Efforts to date have often relied upon identification of tasks — although these may be one basis for instruction and assessment, the more complex interaction of competencies, individuals and environments needs greater consideration.

LIBRARY AND INFORMATION SCIENCE EDUCATION AND TRAINING

Prevalent concerns expressed in the literature on library and information science education and training reviewed to date covered the following topics:

- the need to impart to professionals a background in management/administration,
- the continued relevance of practical work experience as part of the master's level education process (either in the form of field work, internship or practicum),
- the widespread perception of the already multiple but rapidly changing roles library and information professionals must be equipped to take on in the course of lifelong careers, and
- the implications these work environment roles have for the feasibility and quality of specialization within one year Master's degree programs as opposed to two year programs.

Unfortunately, except for the very broad, generalized themes that we were able to discern (as opposed to the authors themselves making these generalizations explicit), the literature shows little consensus. The situation is similar in the literature on continuing education: most authors agree that continuing education has a rightful place both inside and outside library schools and should be supported and formally recognized by employers. However, few have investigated the kinds of continuing education programs that are needed for the profession as a whole, both now and in the future. In spite of rather insular views on continuing education for very specific professional roles, the impact of CLENE in establishing, disseminating and coordinating continuing education activities was very obvious in the literature. Furthermore, it is evident that in order to avoid duplication of continuing education opportunities, maximize those that do exist, and determine future needs, responsibility for such opportunities would best rest in the hands of a single group or organization, rather than being disaggregated by specialization as it is now.

In addition to topics explicitly stated in the library and information science education literature, the underlying threads are also important to this study. They include an all-pervasive user orientation both in traditional librarianship and in other information professional roles. This user orientation of the profession has overall implications for this study that were rarely directly addressed in the literature. For example:

1. The growing requirement to distinguish between a user orientation and the traditional librarianship "service ethic" in light of roles for professionals that are expanding into areas where not only fees to all are charged, but also into areas where the professional must aggressively market both services and information.

2. Who will be the future users/patrons of libraries, information centers, information brokerage houses, etc.? Changes in the user population in the future coupled with rapidly advancing information technologies will directly affect user information needs. These will in turn have a direct impact on the education and training required by library and information professionals to best satisfy patron information demands. In the future, a greater percentage of the population will be advanced in years, many with the frequently age-related physical impairments. Mainstreaming of those institutionalized or otherwise cut off from society, if continued, may also change the kind of patron frequently encountered and concommitantly, aspects of information service provided.

3. As surely as technology is pervading our world, computers will ultimately be commonplace in our homes and with them will come automated access to information on a large scale. If the users of the future are familiar with online searching on their terminals or microcomputers at home, it seems fairly safe to assume that they will no longer be content to have the library/information professional do all of the bibliographic searching — the users will probably want to do some themselves, perhaps with guidance from the professionals. This has serious repercussions for the future of what is now called bibliographic instruction, but is most likely to become broader in the future. Currently, little or no literature exists on professional education for bibliographic instruction; in decades ahead, professionals will need to be trained to provide "patron information access instruction" that actively deals with new media and new technologies. Library/information science schools do not seem to be addressing current needs for education in bibliographic instruction; how well will they deal with future required competencies in this area? How can the schools best deal with the costs of providing hands-on information technology education for their students?

Yet another underlying thread (actually mentioned only a few times in the literature) is the recognition of the necessity to instill in library and information professionals a thorough understanding of, and facility with, problem solving methods. The theory/practice controversy in library and information science education is so conspicuous that to mention it above as a stated concern would have been superfluous, yet here in discussing the need to incorporate problem solving methodologies into library school curricula (thereby, hopefully instilling in professionals problem solving competencies), we may have hit on a bridge between the two camps. Problem solving methods and when and how to apply and/or modify them to suit various work environments may be viewed as one way to prepare entry-level graduates to deal adequately with the peculiarities of practice in individual work settings that can be quite different from the common denominator presented in library and information science schools. The graduate schools cannot be expected to prepare every graduate for all possible specializations — in this way, problem solving methodologies within graduate curricula might be used to prepare the graduate who enrolls in one specialization during graduate training and finds a job in an unrelated specialization of library/information work. In addition, problem solving methodologies tangentially relate to the question (mentioned in the literature albeit infrequently) of whether to include statistics and/or quantitative methods in library school curricula. Problem solving is difficult without data; statistical instruction provides a partial means for ensuring that data collected are appropriate to the problem at hand. The application of statistics to library and information center environments, etc. may in turn help to identify further problem areas.

LIBRARY AND INFORMATION PROFESSIONAL COMPETENCIES

Materials examined as part of the topic, library and information professional competencies, presented specific problems. Little or no consensus seems to exist on what constitutes competency from the standpoint of formulating the components of a competency statement (as opposed to the actual "attitude/skill/behavior" content of the statement).

Concerns expressed in the literature on library and information professional competencies were quite diverse and scattered. Little or no attempt was made to investigate competencies needed by the profession as a whole, although there is a fairly sizeable body of literature on competencies for school media specialists (which is discussed in the section on competency identification, along with task analysis). Much of the literature in this section of the review did not treat library and information professional competencies per se, but rather kinds of abilities that practicing library and information professionals should possess or currently lack, especially in terms of exposing them as priorities or considerations for inclusion in library and information science curricula. Concerns mentioned in such literature include young adult librarianship, state librarianship, library service to the institutionalized and disabled, map librarianship and others. The few items that actually did discuss specific competencies, outside of the school media field, covered areas such as searching OCLC, public services, and competency-based certification for health sciences librarianship. Some attention was given to the notion of competencies for particular roles and functions within particular kinds of librarianship: administration, state library consultant, and interpersonal and other skills needed in emerging library and information fields such as clinical medical librarianship. The observation of these appropriate interpersonal attitudes and behaviors proved to be one of the few common denominators. Although these "communication attributes" were not studied in terms of formalized competency statements with quantifiable behavioral objectives, the literature demonstrated sufficient concern about these attributes that we may want to consider them "generic" (as opposed to specific) library and information professional competencies.

Those themes which were not expressed directly in the relevant literature on library and information professional competencies, like the literature on library and information science education, again deserve a great deal of attention in terms of this project. Competencies, however stated, were rarely touched upon for researchers in the field, and not mentioned (in the literature reviewed) for educators. Any substantive treatment of competencies differentiated by level of staffing (professional vs. paraprofessional vs. clerical) and stage of career as well as competencies for non-library professional practitioners was also generally absent. Perhaps one of the more important aspects of library and information professional competencies omitted from the materials reviewed was the essential non-existence of library and information professional competencies for the future. This deficiency was especially disconcerting in light of the merit placed on planning educational curricula for the future. It raises the question of what graduates need to be able to do (in terms of behavioral objectives) in the future after completing their coursework in terms of effective performance.

The two areas in our literature review, library and information science education and library and information professional competencies, can be taken as a unit and summarized as follows. A great deal of literature exists on traditional library science education, with a small but slowly growing body of materials on education for information science and non-traditional roles within the field. On the other hand, very little formally published information exists on library and information professional competencies. Yet what can be regarded as an overall issue for the field and for our study emerges from this void:

> What assurance do employers have that graduates can perform tasks adequately? Also, what assurance do professional schools have that they are imparting the needed skills in their curricula, if no one attempts to measure whether or not, and to what degree, graduates have attained the competencies necessary to function effectively in work environments?

RECENTLY COMPLETED PROJECTS OF RELEVANCE TO THIS PROJECT

Of particular relevance to this project are three recently published project reports:

- The Information Professional: Survey of an Emerging Field [Debons, et al., 1981]
- Library Human Resources: A Study of Supply and Demand [Roderer, et al., 1983]
- The Conant Report: A Study of the Education of Librarians [Conant, 1980].

Each of these was considered worthy of more than a brief annotation so the remainder of this review will describe the major outcomes of these projects as well as key implications for this current project.

The Information Professional: Survey of an Emerging Field

This book reports a survey, sometimes referred to as the Occupational Survey of Information Professionals (OSIP), which was performed under a grant from the National Science Foundation. The survey attempted to estimate the number of information professionals employed in the U.S. It identified those working as information professionals according to the functions performed, rather than according to job classifications or qualifications; and estimated the number and distribution of such information professionals throughout U.S. organizations. The objectives of the study were to determine:

1. Who information professionals are (i.e., professional-level persons engaged full-time in information work).
2. What information professionals do (i.e., practitioners who organize or process information on behalf of others; those who manage information organizations or programs; those involved in information research, development, or technology; or those who educate or train information workers).
3. Who employs information professionals (i.e., general categories of employers such as industry, government or universities and colleges).

4. Where in organizations do information professionals work (i.e., in organizational units such as libraries, computer centers or information centers).

5. Why information professionals are performing their work (i.e., to support such workfields as finance, research, publication, or general library activities).

6. How information professionals are classified in terms of job titles and education (i.e., reference librarian, economist, systems analyst, etc.).

Nine broad functions performed by information professionals were identified in the study:

1. Preparing data and information for use by others.
2. Analyzing data and information on behalf of others.
3. Searching for data and information on behalf of others.
4. Other operational information functions.
5. Managing information operations, programs, services or databases.
6. Information systems analysis.
7. Information systems design.
8. Education and training of information workers.
9. Information research and development.

The nine functions defined for the OSIP study were too broad for the purposes of this New Directions Project. However, the population of information professionals to which the New Directions Project is addressed, forms a subset of the OSIP information professionals and there is some useful information available from that survey.

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In addition to identifying the functions being performed by information professionals, the organizational sub-units within which the professionals are located were identified. The various sub-units are:

- Abstracting/Indexing
- Administrative Services
- Audio-Visual Media
- Command and Control
- Communications
- Computer Operations
- Databank/Database
- Extension-Outreach
- Financial Analysis
- In-Company Training
- Information Analysis
- Library/Archives
- Management Information System
- Medical Records
- Public Information/PR
- Research/Analysis/Planning
- School/Academic Department
- Systems Analysis/Programming
- Technical Information
- Technical Reports Preparation.

Library Human Resources: A Study of Supply and Demand

The Library Human Resources Study was designed and undertaken to project the supply of professional librarians through 1990. These projections serve as sources of input into the decision-making processes for government policies and programs in education for librarians, library services, and library research. They will also serve as an information source for librarians, library educators, library employers, and potential labor market entrants, especially in terms of providing an early warning system for library labor market imbalances, which may reduce supply-demand adjustment problems.

To conduct the study, it was required that the current library labor market be described, including:

- its dynamics and the sources of supply and demand;
- an estimation of the sizes of the current supply and demand and their rates of change; and
- a forecast of the future market.

Methods used included an extensive literature review to identify existing data, the collection of new data through two surveys, and the development of regression models to project future supply and demand.

The surveys conducted were addressed to library schools and to libraries as employers of librarians. The Library School Survey, which was sent to all of the approximately 1,750 library education programs identified, covered applicants, admissions, completions, and placement of graduates from 1977-1978 through 1980-81. The Employer Survey was sent to a sample of 2,335 of the estimated 43,600 libraries in the United States. It covered the number of employees by type, sex, educational background, and information on transfers into and out of the library. Numbers of employees were obtained over the 1978-1982 period and the remaining data were obtained for 1981 or 1982.

Forecasting models were developed using a variety of methods as appropriate to the data available. For projections of library employment, libraries were classed as public, school (public and private), academic and special libraries. Regression models incorporating relevant variables for each library type were developed and were fit to historical data and then used to predict future demand. For projecting the new supply of librarians emerging from library schools, models based on Freeman's theory of occupational choice were developed. This approach relies on multiple regression models in which supply is related to salaries, and salaries to market conditions. Other aspects of the supply of, and demand for, librarians were projected based on current data and historical trends where available.

The study provides a clear picture of the current employment situation in libraries. In 1982, approximately 136,000 librarians were employed in libraries, 48 percent in school libraries, 23 percent in public libraries, 15 percent in academic libraries, and 14 percent in special libraries. Librarians make up about 45 percent of total library staffs, with 5 percent being other professionals and 50 percent technical, clerical and other support staff. About 80 percent of currently employed librarians have some sort of library degree or certification, with the majority having an MLS degree. Individuals with BLS degrees make up about 12 percent of all employed librarians, and those with school library certification but no library degree account for about 7 percent of the total.

Looking at the current library school picture, there were about 5,000 graduates of MLS programs in 1980-81, 300 graduates of BLS programs, and 1,700 individuals who completed preparation for school library certification without receiving a library degree. Of the total 7,000 graduates, about 80 percent went on to library employment, about 4 percent to information professional employment, 6 percent to other employment, and 10 percent to student or unemployed status.

Study projections show the overall supply and demand situation through 1990. On the demand side, the number of positions in libraries is expected to increase modestly through the mid-1980's and then decline slightly through 1990. Thus the decade of the 1980's is expected to show an even smaller increase in librarian employment than the rather stable 1970's, with no anticipated return to the boom period of the 1960's. Employment in school libraries is projected to decrease from 62,000 librarians in 1980 to 59,000 in 1990, primarily due to the decline in school enrollments. Following a period of slight increases, decreases are also expected in academic library staffing with about 20,000 academic librarians projected to be employed both in 1980 and 1990. Public library employment in the 1980's is anticipated to increase from 30,000 in 1980 to 35,000 in 1990, and special library employment should also increase, growing from about 18,000 in 1980 to 23,000 in 1990. In summary, library employment is estimated at 131,000 in 1980 and projected to be 140,000 in 1985 and 137,000 in 1990.

As the number of jobs follows a pattern of increases and then decreases in the 1980's, the number of individuals completing library education programs and seeking employment is projected to follow a similar pattern of small increases and then a decline. The projected decline is less than that experienced in the late 1970's. Increases and then decreases in the number of graduates are anticipated in MLS programs with the same number of graduates, 5,300, projected for 1990 as were observed in 1980. Both the number of BLS degrees awarded and the number of school library certificate program graduates are expected to decrease in the 1980's, with the former going from 400 to 140 graduates over the period and the latter going from 2,000 to 800 graduates. By 1990, our projections indicate that the mix of library program graduates will have changed from 69 percent MLS to 85 percent MLS.

The effect of the employment patterns anticipated is that most job openings created in the 1980's, especially in the latter part of the decade, will occur as a result of retirements and deaths rather than new positions. The number of job openings, like the number of graduates entering the labor force, will increase slightly and then decrease.

While the trends are expected to be similar for employment and graduates, the rates of change in the two differ sufficiently that it is anticipated that the job market will first continue to improve over the situation of the late 1970's and then, in the latter part of the period, again decline. This statement reflects the job market for traditional librarians, and could be counteracted by increasing movement of library program graduates to non-library information professional positions.

The Conant Report: A Study of the Education of Librarians

The Conant Report discusses a research project which set out to address three principal questions relating to library education:

- "What is the function and responsibility of professional education to the profession it serves, to the students it admits into its formal programs, and to society at large?

- How does the present system of library education measure up to accepted functions and responsibilities of professional education?

- What reforms are needed to improve library education and to bring it closer to accepted standards of professional education?"

Conant approached these questions by considering library education from the viewpoints of those participants involved in it, i.e., library school faculty, students, alumni and employers (in traditional working environments).

The study included a review of the three basic functions of professional education:

> "It determines who enters the profession and what qualifications and educational standards they must meet to qualify for professional practice, it provides formal instruction for those who seek to qualify for professional practice, and it supplies the profession with qualified people, provides continuing education, defines the objectives of the profession and anticipates its future needs."

Conant's approach to conducting the study was to examine existing documentation such as library school catalogs, faculty dossiers, faculty publications, student evaluations of faculty performance, etc., supported by relatively unstructured interviews with representatives from the participant groups. The study was permeated with a lack of rigor in data collection, analysis and reporting which did nothing to support the credibility of the concluding recommendations. As a result, the report has been largely ignored by the library education community, except perhaps to be used as exercises in "How Not to. . . ."

A published composite response [Ramer, et al., 1981] expresses concern about the validity of research methods and procedures utilized as well as other substantive caveats. Ramer points out specific differences between the original proposal and the final report: promised in the proposal but missing from the report is "data on the sources and background of students and on the career patterns of graduates over a 20 year period." Bidlack, in the same article, criticizes the manner in which the interviews were conducted both in terms of possible bias and apparent lack of substantive direction on different occasions on the part of the interviewers. Darling's comments echo those of Bidlack and Ramer on research methodology. He goes on to say: "The reader of the report. . . will not be able to find suitable justification for the proposed reforms in the chapters of uncritical reporting of opinion that make up the bulk of the book."

However, in spite of some obvious shortcomings, the Conant study did raise a number of issues that remain to be addressed. Such issues include:

- the role of educators as gatekeepers to the profession;
- the distinction between professional and nonprofessional training;
- the balance between theory and practice in education and, consequently, the respective roles of the library schools and employers;
- the need and potential for specialization in the field;
- the initiation of library education at the undergraduate level;
- the role of the research community in education;
- the responsibility for continuing education;
- the effectiveness of accreditation.

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APPENDIX 2

SECONDARY ANALYSES

SECONDARY ANALYSES

During the course of this two-year project a great deal of data and information were gathered which related in some way to the education and training of information professionals. We conducted several brief analyses on relevant topics and include them here to provide a context for the identification and validation of competencies.

UNPUBLISHED RESEARCH RESULTS AVAILABLE DURING THE PROJECT

Two unpublished sources of data suggest avenues for additional research once the "New Directions in Library and Information Science Education" project is concluded. Our investigation examined current and future competencies for library and information professionals, and led to a discussion of educational requirements relating to these competencies. The review of literature and research results concerning curricula of library schools, minimum qualifications, professionalism, and several other areas have been additional, but admittedly secondary, areas of concern. These two sources, a study by White and Paris (Employer Preferences and The Library Education Curriculum, soon to be published), and one by Hayes (Profile of Curricular Organization of Schools with ALA Accredited Programs) can be related in certain ways to this project and to each other. Both facilitate direct and indirect communication among "the information profession" participants KRI has identified: professional societies, educators, employers, practitioners and students.

In the case of Hayes' data, the kinds of required and specialized courses offered by ALA-accredited library schools are presented, with distributions of different types of specializations and the corresponding course titles given. Statistical summary tables present frequency distributions of the number of courses offered per specialization in accredited programs (excluding required courses), with an average number of courses per specialization computed; and "... the distribution of total number of courses offered in each type or group of specialties," with an average number of courses taught by type of specialty. This second table, presented below, indicates that "functional specializations", i.e., acquisitions, administration, management, cataloging, indexing, information science, reference, systems analysis, and "other" receive roughly twice the emphasis that subject, type of library, type of clientele and type of materials specializations do.

	Range of Total Courses						Average
Type of Specialty	0	1-5	6-10	11-15	16-20	20	
Functional	1	2	20	23	16	5	13.42
Subject	2	30	28	7	-	-	6.03
Type Library	4	26	30	6	1	-	6.28
Clientele	2	35	37	1	1	-	5.46
Material	2	18	35	11	1	-	6.96

White and Paris' study, on the other hand, presents the results of a survey of a sample of academic, public, and special library directors on their preference for the educational background of newly-hired entry level professionals. While White and Paris' study does examine employer preferences for the library education of their new employees, the authors go further and ask employers to choose among alternatives in modifying the traditional MLS. This is a unique approach and a problem that will undoubtedly face the profession is how to integrate educational objectives derived from validated competencies into existing programs, for as White and Paris state:

> "it is, after all, not likely that present educational programs will simply be eradicated, and new programs built from the ground up. It is far more likely that whatever changes are made will be implemented within the framework of existing degree programs."

One way in which Hayes' study can be related to that of White and Paris' is through the library education course offerings to which employers in the latter study were asked to react. A list of 87 courses drawn from the bulletins of the largest library education programs in the United States and Canada was rated by employers as to the level of importance for all entry level hires and for specific position entry level hires. White and Paris asked library directors to rate each course on the following seven-point scale: 1) essential for all, 2) essential for certain hires, 3) desirable as part of the MLS program, 4) useful but not a major factor in hiring decision, 5) should be learned on the job, 6) can be acquired via continuing education, and 7) unimportant for hiring professionals in this library. The results of their survey were used to determine what employers in different types and sizes of libraries (small, medium, and large academic libraries; small, medium and large public libraries; and medium and large special libraries) felt should be required (core) courses for all new hires, and recommended courses for new entry level employees in some positions. The authors' next step was to examine these ranked courses for consensus by library type. As a result of a high degree of variation in special library directors' responses, the authors were only able to determine consensus for a course's presence in the "curriculum tracks" for academic and public libraries. This was accomplished by distinguishing those courses achieving "... a median score of 2.5 or below in at least two out of three academic and at least two out of three public library groups" from those receiving higher scores (indicating lesser importance).

In comparing the viewpoints of employers and educators as to which courses constitute the needed educational preparation for librarians wishing to work in specific types of libraries, we can look for similarities and differences and identify areas where change is needed. For example, the curriculum track derived from employer consensus in White and Paris for preparation for employment in public libraries lists fourteen courses:

- basic reference,
- advanced reference,
- children's services,
- collection development,
- materials for adults,
- materials for children,
- materials for young adults,
- public libraries,
- library management,
- personnel management,
- introduction to information science,

- organization of materials - Dewey,
- general technical services, and
- cataloging of non-book materials.

When we compare these with graduate level library education courses offered as requirements and as specialized courses as shown in Hayes' study, differences are immediately apparent. Out of the 62 schools providing Hayes with data on required courses, 44 (71%) required their students to take a general introductory course, and 49 (79%) required a course in cataloging and classification and a course in reference. Required courses relating to collection development are subsumed under Hayes' heading of "acquisitions" with only slightly more than half of the 62 ALA-accredited schools supplying data on required courses requiring a course in acquisitions of their students. (It is interesting to note here that White and Paris' analysis of responses from public and academic library directors in small, medium and large institutions shows that only two courses, basic reference and collection development, were given modes of one, i.e., essential for all hires, by these six respondent groups.) Coursework in management, information science, and research methods was required in still fewer schools having accredited programs: management - 30 schools, or 48 percent; information science - 25 schools, or 40 percent; and research methods - 20 schools or 32 percent. "Introduction to information science" was given a mode of one by four out of six respondent groups in White and Paris' study, while a course in information science was only required in 25 of the 62 schools included in Hayes study. Three of six respondent groups gave "organization of materials - Dewey" a mode of 1 while 79 percent of the schools included in Hayes' study reported requiring a course in cataloging and classification. (The divergence in the area of cataloging and classification is significant given that studies have shown that technical services librarians appear to be in demand and given the apparent employer emphasis on Dewey rather than LC. However, upon further investigation, it is evident that White and Paris' characterization of "organization of materials - Dewey" included "hands-on OCLC," and LC was subsumed under what the authors termed a "second" course on materials organization.)

Moreover, public library employers in the White and Paris study have identified fourteen courses, and academic library employers, 21 courses, more than the number most frequently comprising a one year MLS program requiring 36 credits. (This assumes that three credits are earned per course; according to the *1984 Library and Information Science Education Statistical Report*, 45 out the 63 schools with accredited programs, 71 percent, require 36 or *fewer* credit hours.) Looking at White and Paris' curriculum track for public libraries after accounting for courses that are likely to be required of all students (discussed above), we see that the remaining courses are not listed *together* in Hayes' list of courses offered for specialization in public libraries. Many schools offer "public libraries" under the public library specialization and a few listed "materials for adults", "children", etc., under the public library specialization, but these courses appear with greater frequency under Hayes' heading "types of clientele". Other courses, e.g., "cataloging of non-book materials" and "personnel management" fall more predominantly under the type of materials specialization and the functional specialization respectively. That this is the case is important, for it emphasizes that what Hayes terms a "specialization" is clearly not what White and Paris (or library schools, for that matter) refer to as a curriculum track and that the same course can be categorized as pertaining to more than one specialization at a time.

Identifying where change is needed in the educational preparation of entry level librarians is only the first step in setting up an exchange of information and ideas among the "major participants" in the profession. The next step, identifying in what manner the changes should be made, and effecting them, is far more problematic, but actually touches on "doing" rather than just "talking about doing". It is in this light that we should view White and Paris' elicitation of responses as to how library education should be changed according to academic, public and special library directors. At this point we must also broaden our understanding of "education" to include education *and* training, both formal and informal, that is desirable to prepare librarians *optimally* for professional employment. Library employers, when asked to chose one option in the event that "... expressed curricular needs cannot be met through the traditional one-year master's program," indicated that increasing the content of existing courses was their first choice, over lengthening the program. On-the-job training was ranked last as an option in this case, but first when employers were asked to rank options on post-Master's degree education and training. This dichotomy is striking and may perhaps be partially explained as a concern over costs the employers might themselves (as opposed to the professionals) have to pay; responses to questions on employer support of continuing education indicated that while employers did indeed support continuing education for their professionals in a variety of ways, the median cost ceiling for a one-day workshop or seminar was $69. The second-ranked choice of mode of post-Master's study was individual graduate courses (as distinct from graduate degree programs), with association workshops ranked third. It is unclear whether "individual graduate courses" includes library school sponsored workshops, seminars, colloquia, etc. — 61 ALISE member schools enrolled nearly 23,000 persons in continuing education programs aimed overwhelmingly at the local and state or province level in 1982-83, a decline of six percent form the previous year [Association for Library and Information Science Education, 1984].

That library directors, in general, recommended a larger number of courses than is usually included in a one-year Master's program, preferred increasing course content over lengthening the program, and indicated that graduates of longer programs would not receive greater hiring consideration or substantially higher staring salaries points to a significant gap between what employers see as desirable changes in the preparation of their potential employees, and what they as employers are prepared/willing to do about achieving these changes. Perhaps the respondents to White and Paris' study view the professional preparation of new entry level librarians as falling wholly within the purview of formal graduate level library education.

Certainly this is not and should not be the case; the aims of graduate level education cannot be purely only to prepare students for professional employment, and only for a single position at that. Graduate level education must aspire to a higher purpose if it is to be anything beyond vocational; by the same token, it must be realized that entry level librarians have by the time they are hired, responded to a variety of learning situations and that learning must continue, both inside and outside of purely educational settings, if the profession is to be able to respond to the challenges of the present and the future at all.

INFORMATION PROFESSIONAL VACANCY ANNOUNCEMENT ANALYSIS

Introduction

An analysis of published vacancy announcements and literature relating to qualifications for information professionals was carried out in order to determine:

- similarities and differences in qualifications requested by types of information service organizations (e.g., public libraries, academic libraries, special libraries, archives, publishers, etc.) for the variety of professional positions advertised
- how the qualifications relate to different types of competencies (i.e., knowledge, skills, and attitudes)
- the relative frequency with which specific qualifications are requested and the emphasis placed upon these qualifications (e.g., required vs. preferred vs. desired) as an indication both of employers' perceived needs and preparation necessary for candidates for employment.

Information was gathered in an ongoing fashion to cover the approximate period of the last quarter of 1982 through the third quarter of 1983 so that we might study job advertisements over an entire year. After examining the materials collected, it was found that the vacancy announcements (published in journals and newspapers) needed to be organized into groupings to facilitate analysis. At the most general level, advertisements were separated into those covering 1) professional librarian vacancies, and 2) vacancies for non-library information professionals. Not surprisingly, many more published advertisments were found for librarians as opposed to non-library information professionals; there is some indication that many "non-traditional" vacancies are not widely advertised.

The second level of breakdown was by type of library and by type of non-library "information service organization", respectively. When feasible, vacancy announcements were further distinguished by type of position in terms of broad function (i.e., user-oriented, technical, and support).

LIBRARIAN VACANCY ANNOUNCEMENTS

It became apparent, prior to our examination of advertisements for librarian jobs by type of library, that there were a few commonalities in the qualifications requested for librarian jobs in general:

- the MLS is firmly entrenched as a required qualification, with infrequent mentions of combinations of education and experience as acceptable equivalents
- "communication" skills covering oral and written communications, as well as interpersonal skills (i.e., the ability to work effectively with others) however variously termed, were highly valued
- a pro-service attitude (often phrased like "a commitment to providing service") was often noted as a desirable attribute
- advertisements not specifying some sort of experience qualification, whether in terms of a specified number of years or even more narrowly defined, were rarely encountered.

Librarian Vacancy Announcements by Type of Library

A major reason for dividing the job announcements into sets by type of library was to ascertain the relative presence or absence of advertised vacancies within the sets. This initial division left us with a very small number of advertisements for school librarians and a small but somewhat larger number of advertisements for federal librarians. The scarcity of advertisements in these two types of libraries should not be regarded as indicative of a lack of openings, but rather of the presence of other mechanisms by which these vacancies are made known, e.g., publication of advertisements in other sources and advertisement mechanisms that may be highly localized and/or targeted at groups already within that type of organization's sphere.

As opposed to school and federal librarian positions, academic library positions appear to be widely advertised, often in more than one source. Common qualifications frequently requested for jobs in this type of library include:

- an ALA-accredited MLS (i.e, graduation from an ALA-accredited program in library/information science)
- a second "subject" Master's degree (this was most often requested by large universities, as opposed to colleges and smaller universities.) However, it was present as a preferred or desired qualification (as opposed to a requirement) fairly often
- supervisory experience
- managerial experience/skills (sometimes listed with supervisory skills, but closer examination revealed that budgeting, planning, scheduling and "motivating" skills fell under this heading)
- "communication" skills covering oral and written communication and interpersonal skills, with additional emphasis placed upon this area via reference to liaison and user education skills.

In comparison with notices for positions in all other types of libraries and non-library "information service organizations" (ISO's), notices for academic library jobs tended to be the most detailed and specific in their descriptions of the qualifications sought. Desirable experience was often couched in language like "x years of experience, x of which are in (1) blank function and x in (2) blank function, preferably in an x library." Employers, when specifying a preference for candidates with second Master's degrees, routinely specified the desired subject of the second degree.

Other qualifications noted repeatedly for academic librarians, but less regularly than those listed above, are:

- evidence of ability to meet general university requirements for promotion and tenure (research, publication, university/community/professional service) in addition to library assignment
- knowledge/familiarity/interest in automation (this point was usually requested in fairly broad language that can be construed to cover diverse aspects such as the application of technology to information service organizations, familiarity with bibliographic utilities, and systems analysis skill)

- online searching skills and familiarity with subject databases
- bibiographic instruction/user education skills came up from time to time, although the desirability of these skills tended to be function-dependent.

Still more qualifications sought by academic libraries were dependent upon the type of position the professional would hold, i.e., the function(s) the professional would be performing. Prospective catalogers were expected to be familiar with AACR 2, Library of Congress classification system and Library of Congress Subject Headings. Knowledege of MARC and familiarity with a bibliographic utility were also desirable (OCLC received by far the most numerous mentions, with RLIN, WLN and other utilities specified less frequently; understanding of a utility not in use at that site as opposed to the one being used was often viewed as an acceptable substitute). Reading ability in one or more foreign languages was a sought-after qualification; Romance languages prevailed over other specific requests, but occasionally large universities sought candidates with Russian, Scandinavian or Oriental language abilities. Reference librarian candidates were overwhelmingly expected to possess a thorough knowledge of a subject in addition to their background in library/information science. This "thorough knowledge" was most often desired in scientific and technical fields, and then in fields such as business, economics and the social sciences. Knowledge of the humanities or of its individual disciplines was rarely requested in relation to the number of positions asking for subject background. Announcements for reference librarian positions also requested experience in library instruction and database searching with some regularity.

Other positions in academic libraries with associated duties that fell primarily into one functional area included those in circulation and/or interlibrary loan (ILL) and management positions. Advertisements for circulation/ILL positions seemed more likely to call for knowledge of automated systems and pertinent bibliographic utility subsystems/routines. Management positions were likely to request a greater degree of overall experience as well as skills in planning, budgeting, personnel management, public relations, general administration, and knowledge of technological applications.

A number of academic library positions were for individuals to perform duties within more than one function. Not surprisingly, a wide variety of expertise in various combinations, covering knowledge of bibliographic utilities, subject background, bibliographic instruction experience, knowledge of automation, etc. was desired for these jobs. Present in a smaller, but still significant proportion, were announcements for jobs in which professionals dealt primarily with a single type of material — serials, goverment documents, and audio-visual materials are common examples of this type, with corresponding qualifications looked for in candidates.

Vacancy announcements for jobs in public libraries tended to be worded in more general language than those examined pertaining to other types of libraries. A higher proportion of vacancies were for generalists; i.e., positions in which the individuals perform duties within more than one function. However, certain types of specialist positions do exist within public libraries: children and/or young adult librarians and managerial jobs in the form of library (system) directors, branch directors, and occasionally, library department (technical services, public services, etc.) heads. Most public library announcements specified the MLS as a requirement and specified a number of years and/or a specific type of experience as preferable. In terms of specialist positions, if one regards state library agencies as being a type of public library because they deal with the full range of patrons, even indirectly, new roles emerge for librarians: as consultants for networking/systems analysis activities, as instructors for agency-developed continuing education programs, in helping to administer grants, in collecting and disseminating data useful to libraries in that state, and in research and evaluation. For state library vacancies, the MLS was usually listed as a requirement with public relations, communications, and to some degree, research and analytical skills receiving a high degree of emphasis. As was common for public library positions, state library agency announcements called for prior professional experience.

In some cases, candidates who were to fill vacancies in public libraries were required to be certified or at least eligible for certification within that state, especially when the library was supported by state funds. (See pp. 2-26 through 2-30 on Certification of Information Professionals, for further details.) Public librarians, depending upon the sort of library and/or its location, were occasionally called on to possess additional characteristics; i.e., vacancy advertisements for positions in the southwest mentioned a preference for bilingual (Spanish-English) candidates from time to time, and institutional libraries (correctional facilities) did sometimes note a preference for candidates with law backgrounds. Specialist vacancy announcements, e.g., those for children's/young adult librarians and managerial positions, tended to be rather specific in terms of the qualifications sought. Familiarity with audiovisual materials, knowledge of children's literature, storytelling skills and even puppeteering and knowledge of child development/psychology were noted for the former, and considerable experience (several years in an administrative position in addition to basic professional experience); planning, budgeting, personnel and public relations skills; and knowledge of automation and cooperative arrangements were noted for the latter. The occasional advertisement for a cataloger in a public library tended to ask for familiarity with Dewey Decimal Classification, as opposed to the Library of Congress classification system for academic library vacancies.

In general, public libraries as employers seem to be more concerned with "attitudinal" qualifications when compared with the heavy emphasis placed upon both educational requirements and skills by academic libraries. This concern, however, does not appear to point to a lack of importance of these other types of qualifications, but rather to the relative rank given to factors pertaining to attitudes such as commitment to service, motivation, leadership and initiative, etc. Moreover, specific knowledge and skills were noted in a proportion of announcements, but with a considerable degree of variety rather than conformity. Some of the qualifications mentioned of this type included database searching skills, community outreach skills, and knowledge of specific library operations (cataloging, circulation, etc.). Seldom were subject backgrounds requested.

Copies of actual vacancy announcements for federal librarian positions were difficult to come by, as there is no single agency that keeps them on file. Nor are they advertised in professional journals to the same extent that jobs in other kinds of libraries are. Despite this lack of information, we do know that, for the time being, the MLS or an equivalent in terms of education and experience is still a requirement for federal librarian jobs. There is some evidence that previous professional experience is preferred and that candidates may be called on to possess a knowledge of automation and bibliographic databases for a proportion of the vacancies. However, even though qualifications for all professional librarian positions are subject to change with the passage of time, qualifications for federal librarians are subject to immediate and wide-ranging alteration due to the revision of the OPM (Office of Personnel Management) Occupational Standards for Librarians (GS-1410 series) [U.S. Office of Personnel Management, 1982]. (Though not all federal libraries are covered by the OPM standards.)

Specific qualifications for federal librarian positions currently vary from agency to agency and are likely to continue to do so. As the federal government is heavily involved in the use and provison of information for a wide variety of purposes, the nature of the qualifications for federal librarians are dependent upon the mission of the agency (commission, division, bureau, etc.) within which the library is located. These agencies range from art museums within the Smithsonian Institution to the Department of Energy, Department of the Interior, Department of Labor, Department of Justice, and so on, each needing qualified individuals with very different backgrounds. The Library of Congress, because it collects such an enormous range of materials, often seeks candidates with non-Romance and even esoteric (e.g., Swahili, Urdu, Czechoslovakian, Hungarian, etc.) foreign language skills. Qualifications sought in candidates by other federal libraries may often also pertain to the users served; the users at the patient library of a federally sponsored hospital are likely to have very different information needs from those of the users of the National Library of Medicine or those of the users of school libraries which fall under the aegis of the Bureau of Indian Affairs. These different user needs in turn necessitate staff with qualifications appropriate to each situation.

Another type of vacancy announcement examined was for health science librarians. With regard to library type, health science libraries are generally found in three sectors: academic institutions; federal agencies, including the Veterans' Administration Hospitals, the National Library of Medicine, etc.; and hospitals not tied to academic institutions, and other businesses relating to medicine that operate in the private sector. Even though the vacancy announcements analyzed crossed these sectors, they will be discussed together because of the high degree of uniformity in the qualifications sought. As in academic libraries, graduation from an ALA-accredited program was frequently cited as a requirement. Experience in online searching, especially with regard to NLM-produced and other health science related databases, was also commonly noted. Unlike general academic library vacancy advertisements, health science librarian advertisements rarely called for a second (subject) Master's degree, although emphasis was expressed for subject background qualifications by way of specifying an undergraduate background/degree in the life sciences or related fields (sometimes as a preferred and sometimes as a required qualification). Specific professional experience in a health sciences library was often mentioned as a qualification, from time to time further stipulated by number of years and library function (as has been previously encountered in advertisements for academic librarians). In addition, like all other librarian vacancy announcements discussed above, communication and supervisory skills were generally requested by health sciences library employers, although initiative and problem-solving appeared to be indicated somewhat more often for health science vacancies than for other vacancies (with the possible exception of managerial-level jobs).

Medical (health science) librarian vacancy announcements listed still other candidate characteristics with less regularity. Those in this set included: organizational skills; skills/experience in bibliographic instruction, familiarity with online circulation systems, and familiarity with MEDLINE, MEDLARS and other relevant NLM activities and products. Some mention was given to the notion of MLA certification — usually not as a required qualification and most often in terms of eligibility for certification, sometimes within a specific time frame. With regard to specific library functions, titles given to the positions to be filled were rarely indicative of the functional area, but most jobs for health science librarians seem to have a high component of user-oriented tasks. Few announcements were encountered for medical library catalogers, but those that did come to our attention tended to note familiarity with OCLC, MARC, and MeSH as specific qualifications in addition to general qualifications of education and experience. Announcements for managerial positions in health science libraries were much like those in other libraries in terms of the kinds of skills and the considerable experience required, although the Ph.D. was mentioned perhaps more frequently as a desirable qualification.

NON-LIBRARY INFORMATION PROFESSIONAL VACANCY ANNOUNCEMENTS

Only a very small number of non-library information professional positions are advertised in journals typically read on a national level by librarians, and more importantly, by students and graduates of library/information science degree programs seeking "non-traditional" jobs. These positions are advertised to a somewhat limited and sporadic degree in major newspapers. Advertisements may also appear from time to time in subject-oriented (as opposed to occupation-oriented or profession-oriented) journals. Whatever the case may be, job titles vary greatly and often bear little obvious connection to information work. Yet additional positions may exist but may not be publicly advertised at all. Short-term contracts and projects for which documents need to be indexed and abstracted, literature searches done, etc. are widespread and may be accomplished by information contractors or by entrepreneurial individuals who often need competent staff very quickly and therefore do not advertise.

Not all non-library information professional positions can be viewed as non-traditional. In some cases, professional prestige and jargon have led to a change of name, i.e., technical information center for special library, etc. Are the professionals who work in these settings "non-library information professionals" or special librarians? With this question in mind, it sometimes becomes quite difficult to distin- guish vacancy announcements for special library positions from those not in libraries on other than a purely semantic basis. Therefore, we have chosen to combine our discussion of vacancy announcements in these two types of environments (with the exception of readily-distinguishable work settings).

At this combined level exist some common denominators of qualifications sought by both types of employers: professional experience, scientific/technical or business background, and good communication skills were frequently requested of candidates. However, in contrast, we see that only in special libraries is the MLS firmly entrenched (although certain non-library work settings, e.g. information service companies, technical information centers, database distributors and services, frequently mentioned the MLS as one kind of evidence of suitable educational preparation). Additional differences include the oft-cited need for those not in libraries to possess marketing skills/experience. Mentioned to a somewhat lesser degree was the need for candidates with entrepreneurial attitudes and, occasionally, product development skills. Within the broad topic of technology-related qualifications, a greater assortment were generally called for in non-library settings. Special library employers typically sought professionals with familiarity, sometimes specified in terms of the number of years, with online database searching. Database searching experience was also valued by non-library employers, but most often within the larger context of "experience with online information systems". Systems analysis skills, and in some instances, database design skills were less commonly requested qualifications sought by non-library organizations. In terms of the functional grouping by which positions advertised could be categorized, there seemed to be a preponderance of primarily user-oriented positions open in special libraries; most of the vacancies were for reference/public service librarians. Outside of libraries, information professional jobs appeared to have a greater mix of functions to be performed, with user-oriented/support function combinations prevailing. A few predominantly technical function positions were advertised by non-library employers — jobbers sometimes sought catalogers, other types of information service companies might look for indexers, abstractors, document analysts, etc. Other types of non-library employers (e.g., archives, records centers) tended to have a heavy concentration of positions relating to what is commonly known as technical processing with stress placed not only on describing and organizing the collection, but also upon storage, maintenance and disposal/weeding (e.g., development of retention policies and schedules, etc.).

As a result of the availability of a sufficient number of relevant published vacancy announcements, we were able to separate out certain kinds of information professional positions from the combined discussion presented above. The categories of non-library information professional vacancy announcements investigated in detail were limited to vacancies in the conventional (i.e., non-electronic) publishing sector, and vacancies for archivists.

Conventional Publishing Sector

Vacancy announcements examined for positions in the conventional publishing sector were unlike all other information professional advertisements examined in several respects. Foremost, the publishing industry deals with information at a different stage of its life cycle: the manuscript or its equivalent and the newly published document. The industry therefore emphasizes functions that deal with the "capture and standardization" of information, i.e. creation and recording, and production. However, this emphasis most certainly does not exclude tasks necessary to the profitable dissemination of this information (sales) that fall under the category of support functions: managing, planning, marketing, etc. Additional less obvious tasks that surface under other information professional functions include gathering data on buying habits and demand for specific types of items (searching and retrieval), the analysis of such data for marketing and planning functions (analysis of information), and the process of selecting which manuscripts to produce, and items to reprint, revise, and allow to go out of print (collection development). Secondly, despite these unquestionably information-related functions, the conventional publishing industry by and large does not describe itself in the same terms as the remainder of the information profession. By way of analogy, advertisements for other non-library information professional jobs, despite job titles that can sometimes obscure the nature of the work performed (e.g., curator, researcher, biochemistry professional, customer service representative), use terminology describing the duties to be performed that sets the position fully within the confines of the practice of the information profession. For example, verbs like index, abstract, digest, document, search, organize, analyze, catalog, collect, preserve, and evaluate were used in connection with nouns like data, collection, records, and information. The conventional publishing industry neither uses such terminology, nor, much more importantly, perceives the information content in the vocabulary it uses to describe its activities. (Terms such as coordinate, edit, produce, plan, acquire, select, design, develop, write, research, promote, etc. are used in the context of individual manuscripts and documents, conceptualization of new documents/series of documents, analysis of potential demand, and analysis of competitors' products and strategies.)

Further investigation of the self-perception of the publishing industry reveals another distinction between it and much of the rest of the information profession. As opposed to a primary concern with an aggregation of documents (usually published) that may be organized into a collection, abstracted, indexed, disseminated, converted to machine-readable form, analyzed, preserved, etc., conventional publishing appears to place its (informational) emphasis on: (1) the development of the individual "document" (used in its generic form) to a formal state; (2) the gathering of information that will lead to the greatest/most profitable marketing of this individual document; and (3) the gathering and analyzing data about the profitability of documents as inputs into the acquisition of new manuscripts and the conceptualization of new documents.

That the publishing industry's self-image is one of concern with the development, production, and sale of individual products may well explain its "business" as opposed to "information" orientation. This business orientation can be seen in the vacancy announcements, as evidenced by the qualifications sought. Educational background qualifications were sometimes cited loosely (e.g., Bachelor's degree), but equally as frequent were advertisements that listed Bachelor's degrees in English, Journalism, Business Administration, and Master's degrees in Business Administration/Marketing. Experience was specified in terms of the number of years in a particular publishing function (e.g., 2 years as an acquisitions editor, 3 years as a marketing manager, and so on), but in contrast to many librarian vacancies, type of publishing setting (e.g., elementary/high school ("el/hi") publisher, scholarly publisher, university press, trade publisher, journal publisher, etc.) was not specified as frequently with regard to experience for non-managerial level positions. Other business-oriented qualifications included the occasional call for candidates with a background in finance, as well as the mention of budgeting/costing skills and contract negotiation skills. Marketing experience and/or skill was very frequently listed, regardless of the job type.

Additional qualifications sought nearly "across-the-board" were creativity, motivation, strong communication skills, and to a somewhat lesser extent, managerial experience and/or skills. The financial qualifications listed above, on the other hand, were featured primarily in non-editorial vacancy announcements. Still additional qualifications generally appeared in vacancy announcements for editorial and production staff jobs below the managerial level. Qualifications of this sort included experience in book acquisition and development, editing experience, knowledge of all phases of book production, and knowledge of book design, as well as an occasional mention of computer literacy.

A final group of qualifications surfaced which seem to depend upon the type of item published and/or particular variables associated with the item's intended readers. Knowledge of children's literature, curriculum development skills/experience and even teaching experience were cited from time to time in "el/hi" publishing advertisements; and specific subject backgrounds (e.g., medicine, social studies, crafts, etc.) were cited by employers publishing materials with subject content falling into those areas. Moreover, there are some indications that publishers are investigating publishing newer, non-traditional media such as software and may be seeking personnel qualified to assist in the development of products of this kind.

The conventional publishing industry's business/product orientation has naturally come about because of its commercial cost-recovery emphasis, which currently separates it from libraries and other "information service organizations" that primarily provide services rather than products. However, many non-library information professional vacancies are and will continue to occur in a subset of information service organizations that we may be referred to as "information businesses"; businesses such as database producers, distributors, and services, as well as brokers, vendors, jobbers, etc. that also have a commercial cost-recovery emphasis. These information professional vacancies exist in other information businesses as a result of the businesses' realization that they need people who are qualified to work with information regardless of its format or purpose as well as people who are knowledgable about business practices and commercial viability of products/services.

Archivists

The advertisements for archivist positions examined tended to use fairly generalized language in the qualifications sought. Far less emphasis was given to the specification of skill qualifications for archivists than was given to this area in advertisements for librarians in general; i.e., instead of stating that the candidate "must be able to use x or do x", archivists advertisements were more likely to state that "the candidate must possess a basic familiarity of/throrough knowledge of/or background in x". Employers of archivists seemed to focus upon education and experience in their announcements with, for the most part, little emphasis on other kinds of qualifications. This particular focus was somewhat surprising, given that most archives openings are apparently occuring in the academic sector and in institutions with a scholarly/research inclination. Perhaps this may be explained by the frequent dichotomy between employer-produced descriptions of vacancies and their shorter published announcements of the same positions. In any case, when compared with qualifications cited for academic librarians, there was very little information about the particular skills required of archivists. (General skills may be inferred from the descriptions of duties.) The majority of archivist positions called for the candidate to possess an M.A. in History or to have completed an ALA-accredited library/information science degree program, with managerial positions frequently requiring a Ph.D., though more often in history or a related discipline than in library/information science. Regardless of the degree preferred, employers did note a strong preference for coursework/ training in archival administration. Rarely were second subject degrees called for, or even both an M.L.S. and an M.A. in History preferred.

However, in terms of subject background as opposed to subject degree, History prevailed over and above all others. In fact, many employers cited a preference for candidates who were familiar with the specific subject of their collections, which tended to be regional and/or local American history (e.g., the Southwest, South Carolina, etc.). Too, experience qualifications were commonly broached in less stringent terms than in many announcements for librarian positions: employers might ask for x years of professional archives experience, or perhaps x years of professional archives experience in x kind of archive, but length of experience performing a specific task or function was rarely mentioned. Professional experience not in an archive, e.g., with a special collection or even in a library, was sometimes noted as acceptable. Many positions called for several years of professional experience, with managerial positions typically requiring considerable experience.

Returning to the other types of qualifications cited for archivists, announcements commonly called for good communication skills, like librarian vacancy announcements. Further specification of communication skills was occasionally made: from time to time employers called on candidates to possess grant writing abilities. (Grant writing ability may indeed be more important in an archives setting than it appears to be — many positions in academic settings were grant-supported and temporary.) Employers of archivists for some reason had a decided preference for the word "administrative" over "management" or "supervisory". Such skills/experience were sought to a less marked degree in archives than in libraries as evidenced by announcements examined. Only rarely were foreign language reading abilities called for; this may be explained in part by contrasting the nature of academic library collections (where foreign language skills are frequently a necessary working tool) with the apparent emphasis of archival collections on more recent periods of American history, i.e., the 19th and 20th centuries. In the few cases where foreign language skills were requested, the archive in question invariably dealt with some aspect of European history and/or ethnic groups in the U.S. Somewhat surprisingly, knowledge of the principles and techniques of conservation did not receive any particular stress (in light of the relative infrequency with which it was mentioned), nor did familiarity with technology that might be used to facilitate storage and access to archival documents and/or record them on more permanent media. (Such is the case for many employers of archivists, but these same qualifications were prominent and further specified in announcements for vacancies within the National Archives and Records Service, especially for managerial positions.) Moreover, even though it was typical for employers to give brief descriptions of the archival collection mentioning the types of media present (e.g., papers, manuscripts, music, photographs, microfilm, etc.), almost no distinct mention was given to relevant qualifications such as knowledge of the physical properties of non-paper documents, nor of familiarity with different methods for organizing and providing access to these materials.

The majority of the vacancy announcements examined for archivist positions were for openings in academic and other scholarly institutions. Few advertisements for positions in corporate archives were encountered. Within academic institutions, some archival posts carried faculty rank and/or were tenure track — the proportion appeared to be similar to, if not somewhat smaller than, faculty rank/tenure track for academic library positions. In fact, academic archivists frequently seemed to be classed with academic librarians in terms of pay scale. Also, position descriptions for academic archives openings often mentioned that the incumbent would have some responsibility for/connection with the library's special collections and rare books.

The fact that specific skill and attitude type qualifications are not heavily emphasized in advertisements for archivist jobs does not necessarily mean that employers are not seeking candidates with qualifications of this type. It may mean that these qualifications are sought at a later stage of the recruitment process — e.g., after initial screening of resumes, on a formal application form, or during interviews. On the other hand, one may conjecture that this lack of emphasis in published advertisements is perhaps indicative of greater equilibrium in the supply and demand situation for archivists that in that for librarians.

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CERTIFICATION OF INFORMATION PROFESSIONALS

General Overview

Certification of information professionals can be divided into two spheres: librarians and library personnel, and non-library information professionals. As one official aspect of credentials for practice, certification in the former sphere is akin to licensure and qualifying examinations in other professions such as law, medicine, and nursing. In most occupations, credentials are established as a means of ensuring reputable, acceptable standards of on-the-job performance. However, with regard to library personnel, certification functions less as a gatekeeper into the profession and more as a baseline for minimum qualifications. As such, certification for library personnel is currently entrenched in only one area: school libraries/media centers, although certification requirements also exist for public librarians, medical librarians, and law librarians.

School librarian certification is generally handled by the State Boards of Education, which set up independent requirements for the state in question. These requirements are frequently based upon teaching credentials, often calling for a library, library-media, educational media, or audiovisual endorsement or validation of the teaching credentials for specific subject-related practice.

General education requirments vary a great deal amongst the states, and professional education requirements (i.e., library science/educational media) also differ from state to state in terms of the number of credit hours and the specific coursework required, as well as the degree level at which these courses need to be taken. Within the same state it is also not unusual for there to be several levels at which school librarians may be certified and more than one means by which they may accomplish this. Levels of certification are sometimes structured around the teaching level of the educational institution in which the librarian will be working, e.g., elementary school, secondary school, and K-12 endorsements, on the one hand, and/or the professional level at which the librarian will be expected to perform, e.g., associate, specialist, and director on the other hand. The length of time the certification remains valid (when specified) is very fluid, but in some cases appears to have a direct relationship to the professional level at which the librarian will perform. Many other aspects of school librarian certification are not uniform; for a look at some of the salient characteristics, see Table 1 at the end of this Appendix.

Public librarians are sometimes required to be certified in cases where the library is supported in whole or in part by state funds. Certification for public librarians varies from state to state, with some states having no certification law or plan, and others having: (1) voluntary certification (in order to encourage continuing professional development), (2) multiple levels of certification for various professional levels and/or positions based upon the size of population served, or (3) certification requirements for head librarians alone, often further restricted to a single level/size (e.g., system, county, etc.) of public library facility, etc. The rationale behind certification as a requirement for the library's eligibility to receive public funds appears to be one of ensuring quality public information services in return for public funds. Unlike school librarian certification, however, certification of public librarians, on the whole, appears to be far less complicated and far more infrequent. Little current, formally published information on this topic exists, but information that could be collected from state education agencies, state library agencies, and published literature has been analyzed and is shown in a generalized format in Table 2 at the end of this Appendix.

As opposed to both school librarian and public librarian certification, which fall under the auspices of state agencies and are accomplished on a strict state-by-state basis, medical librarians across the U.S. may be certified by the Medical Library Association (MLA), a professional society. Current requirements for MLA certification are the following: 1) graduation from an ALA-accredited program in library/ information science, 2) successful passing of the MLA competency-based examination, and 3) two years of experience as a professional health services librarian gained after completion of the ALA-accredited program. Provisional certification, valid for five years, may be granted to applicants who have completed only requirements 1) and 2) listed above. Unlike school and public librarian certification, certification for health sciences librarians is uniform, with only two levels: provisional and full. Recertification every five years is mandatory and is not an automatic renewal on the basis of evidence of successful practice/experience; completion of continuing education activities during the five-year period or successful completion of the current MLA certification examination at the end of the five-year period is required, thus ensuring that certified individuals remain aware of the latest developments in the practice of health sciences librarianship. MLA certification is frequently described as preferred/desirable for positions in health sciences libraries, especially in terms of the candidate's eligibility for certification at a later date, and could be regarded as less firmly entrenched than school librarian certification but more than public librarian certification in terms of its mention as a minimum qualification for employment. However, this situation is by no means static, and MLA certification could possibly become more of a minimum qualification in the future.

Certification of law librarians is also carried out under the auspices of a professional society, the American Association of Law Libraries (AALL). Like MLA, AALL's requirements for certification are uniform for all states. However, it is not clear whether AALL will certify librarians who are not its members. Currently there are four categories under which law librarians may apply for certification. The first category entails (a) possession of a graduate degree from an ALA-accredited program, (b) possession of a law degree from a school approved by the American Bar Association (ABA) or American Association of Law Schools (AALS) or admission to the Bar, and (c) two years of professional library experience, one-half of which must have been in a law library. The second category has no library/information science education requirement, but the law background (b, above) still stands, and four years of professional library experience are called for, with half being in a law library. The third category requires no law background, but those who have graduated from an ALA-accredited program and possess six years of professional library experience (half in a law library) may be certified. Persons who have graduated from non-accredited Master's programs and who possess eight years of professional library experience (half in a law library) may also be certified.

Recipients of a Bachelor's degree with a major in library science are required to have ten years of professional library experience (half in a law library). AALL equivalency mechanisms do not stop here: the fourth category is for individuals with twenty years of responsible law library experience and outstanding contribution to the profession. AALL certification is unlike some of the other types of certification discussed above in that it (1) calls for a second (law) degree in two out of four categories, and (2) has established mechanisms whereby individuals lacking either the law education or a graduate degree in library/information science from an ALA-accredited program can be certified. Few data were available from which to determine the prevalence of certification as a qualification for employment as a law librarian.

General certification of all librarians, regardless of the type of library or subject discipline in which they work, does not exist. However, the National Librarians Association (NLA) is currently advocating the development of a voluntary certification program for all librarians. In its draft proposal, the NLA states: "the goal of better meeting the library patron's needs by guaranteeing minimum professional competencies will be furthered by a program that evaluates the professional experience of librarians working in the field." Proposed NLA certification requirements as of January 1, 1983 include: 1) completion of an MLS degree, 2) 5 years of experience as a librarian, and 3) for each year of experience, at least one element of continuing education/professional activity. When compared with the other types of certification for librarians discussed above, certification of librarians by NLA is most like certification of health sciences librarians by the Medical Library Association: both fall under the auspices of a professional society and both have uniform, national requirements for eligible applicants. However, NLA certification as it is now proposed calls for a requirement of 5 years of professional practice for eligibility, as opposed to MLA's 2 year requirement, and NLA makes no allowance for even provisional certification of new entrants into the profession, unlike all other types of librarian certification. Still, it must be emphasized that NLA's program is not in its final state and might well be substantively altered in the future.

Returning to the sphere of non-library information professionals, little importance currently appears to be placed upon the issue of certification. One reason for this lack of emphasis may be that the information profession, especially outside the traditional settings, e.g., libraries, is developing too rapidly in many tangential directions to collectively consider the common denominators comprising optimal professional performance. It is necessary to identify these general characteristics of service/practice before moving on to determining the optimum qualifications of individuals providing service as a basis for certification requirements. In this light, certification for non-library professionals in general is in much the same state as certification for librarians in general; little development is occurring at the generic level, but development at the specific level (subprofessions and/or individual professional associations) is well underway or has at least begun. At the specific level, the Institute of Certified Records Managers has developed a certification program for records managers. Based upon a Bachelor's degree and three years of professional experience in the field of records management, certification by the ICRM also requires a successful score on their examination covering records management. Satisfaction of all three requirements (with substitution/equivalency rules governing the mix of education and experience) within a five-year period is necessary for certification. There is additional evidence that some other professional societies may be interested in certification and/or have developed certification programs, but many of these societies are more concerned with computer software, hardware, and machine-readable data than they are with storage and retrieval of information in all its forms. However, as the non-library information segment of the profession grows and as avenues for specialization within this segment stabilize, we may well see a concern with certification in the future as a means for providing professional development and recognition, as well as an assurance of quality performance.

ISSUES IN THE CERTIFICATION OF INFORMATION PROFESSIONALS

The issues that have emerged during this investigation of certification of information professionals have much in common with licensure and other types of credentialing in other professions: an assurance to the public that the recipient of such a credential will provide competent, quality service and is worthy of their confidence. Unlike many other professions, however, the information profession can be said to provide an intangible service that rarely leads to a product or result obvious to the service recipient, let alone a standardized product. As opposed to the other professions/occupations where credentialing methods are/have been established, the segment of the information profession of which the public is aware (e.g., librarians) is comparatively small in number and constitutes only a fraction of its members (see Debons, et al., 1981, for one estimate of the size of this profession). Furthermore, the information profession is itself quite diversified: by work setting, type of work performed, subject matter dealt with, and/or a combination of all of these factors. Consequently, there is little uniformity upon which to build "baseline" credentials for the profession as a whole. All of these characteristics make discussion of certification for information professionals a particuarly complex topic which can best be broken down into a treatment of some of the issues that appear to flow from these attributes. The issues that will be addressed in the rest of this section are:

- at what career stage can an individual be initially certified vs. at what career stage should an individual be initially certified
- absence/presence of competency-based certification and the relationship of certification competencies to on-the-job performance
- certification as opposed to, and in relation to, other kinds of professional credentials and its future implications for the information profession.

Career Stage of Certification

As described in the previous section, certification for librarians varies a great deal with regard to requirements and career stage at which the individual may receive initial certification. Initial certification may be the first in a set of levels leading to certification for a management position, may represent a provisional certification with the next step being a full certification, may be the only kind of certification available to an individual in that type of library in that state, may be the single credential for librarians in a certain type of library, (e.g., MLA), or may be proposed as a baseline credential for all librarians, as in that which is under development by the National Librarians Association. In addition, the importance of the career stage of initial certification is further heightened by the length of certification validity, which also varies according to circumstances from a year or two to life. In certain kinds of libraries, i.e., school libraries and public libraries receiving state aid, certification has become a minimum qualification for employment. This requirement might conceivably spread to other kinds of libraries as certification procedures develop further, depending upon market conditions. As criteria for initial certification differ widely, we observe that even within the same type of library, there is no agreement on what constitutes sufficient preparation for quality practice at the first "credentialed" service level. This lack of consensus, coupled with the fact that initial certification may be received upon the bases of: 1) a minimal number of credits in library service and professional employment, 2) years of professional service in addition to graduation from an ALA-accredited MLS degree program, and 3) combinations and variations of 1) and 2) above, makes certification a questionable means of assuring quality performance at the generic level. The notion of quality performance becomes further complicated when considered in connection with certification as a minimum qualification of employment. Depending upon the degree to which certification becomes a minimum qualification in proportion to career stage of initial certification, certification might possibly begin to take on a gatekeeper function (i.e., limiting the ability of those otherwise qualified to find professional employment, and therefore their entry into the profession as actual practitioners).

Competency-based Certification and Its Relationship to On-The-Job Performance

Rarely is certification for information professionals described as a means for confirming the attainment of specific competencies by individuals; rather, it is implied that receipt of certification denotes a competent individual. What characterizes competent on-the-job performance is seldom mentioned in connection with certification and, to our knowledge, has not been defined. Thus, requirements for recertification and/or secondary level certification akin to "x years of demonstrated successful experience" are vague and confusing in that what constitutes successful experience is open to interpretation. Are individuals successful (as opposed to adequate) because they have managed to retain their positions over several years? If not, is success to be measured in terms of professional status, salary, recommendation by supervisors and/or some type of competency assessment, be it an oral interview, an examination, or on-the-job observation, etc.? Other common certification requirements that have a tenuous relationship at best to on-the-job performance include those that mention "x credit hours in library service" without mentioning the academic level at which these credits must be attained or the specific courses that should be taken. (See Tables 1 and 2: not all states are this general in their certification criteria.) Vague educational criteria for certification leave room for irrelevant courses and do not require that the individual has a current knowledge of the field as of the date he/she is certified. States that grant certification with long term validity or permit recertification on the basis of years of service alone do nothing to ensure that practitioners continue to provide service that is up-to-date with the latest developments in the field. This lack of relationship between librarian certification and competent job performance is, fortunately, currently common to only certain states in their requirements for school and public librarians. Certification for health sciences librarians as administered by the Medical Library Association currently calls for successful completion of a written examination designed to assess "entry-level competencies," with recertification based upon continuing education units or succesful recompletion of the exam at the end of the five-year period. The competencies to be assessed were determined from employment-based situations and "... are reviewed annually for continued relevance." Certification for all librarians in general as proposed by NLA implies later adoption of certification criteria based upon true competency assessment: "the goal of better meeting the library patron's needs by guaranteeing minimum professional competence will be furthered by a program that evaluates the professional experience of librarians working in the field. Testing devices both for the body of knowledge and for the skills that constitute librarianship which are precise enough to be validated need to be developed, but it will take time to do that." For non-library information professionals, there is as yet no way to examine the relationship between certification requirements and on-the-job competencies, for jobs are evolving with so many different names and specialties that few have even attempted to analyze them so that competencies might be developed. Certification for non-library information professionals has not yet become a widespread matter of concern, even at the specific as opposed to the generic level (although certification criteria for records managers based upon receipt of a Bachelor's degree, three years of professional experience and successful completion of an examination covering the subject of records management have been established). Such is the case with non-library information professionals now, but it does not stand to reason that this situation will continue into the future. As the information age develops over the next few decades, the public will begin to perceive the benefits they derive from information services and will assign greater recognition to the information profession, eventually moving to the placement of societal value on the assurance of quality information services as provided by qualified professionals. As this happens, mechanisms for credentialing the information professional will develop, but in what manner they will do so and when remain unknown.

Certification as the Credential for the Information Professional and its Future Implications

Societal mechanisms for providing quality assurance differ with regard to the "body" that provides the service or product, i.e., individuals, organizations (corporations, non-educational institutions, businesses, etc.), and educational institutions are all subject to different types of credentials. Here, we are only concerned with individual information professionals and the methods by which society ensures that they practice in a competent manner (provides quality service). Certification, moreover, is not the sole means for sanctioning individuals' performance of their profession; licensure also applies to individuals. Both means require that individuals meet a set of "predetermined qualifications", although as mechanisms they can be distinguished from each other in terms of purpose. Certification is the process by which a non-government agency or association grants recognition to an individual who has met predetermined qualifications specified by that agency or association. Licensure is "the process by which an agency of government grants permission to persons meeting predetermined qualifications to engage in a given occupation and/or use a particular title ... by certifying that those licensed have attained the minimal degree of competency necessary to ensure that the public health, safety, and welfare will be reasonably well protected." Although certification and licensure differ in purpose, this distinction can become blurred in instances where certification is a minimum qualification for employment; certification then becomes one aspect of de facto permission to engage in practice, the gatekeeper function referrred to earlier.

Professional credentials for individuals often do more than assure quality service. Whether intended or not, credentialing (by whatever means) can provide professional recognition amongst one's peers (especially in the case of certification administered by professional societies), as well as a means of further professional development after the fulfillment of minimum qualifications.

When credentials are based upon vague or outdated criteria or are not validly linked to competent on-the-job performance, individuals who receive these credentials run the risk of expending time and effort (as well as money in many cases) to satisfy criteria that may lack relevance to their jobs. The profession in question runs the risk of authorizing the credentialed individuals as competent to practice when, in fact, they may not be competent. As it is so difficult to define the information profession, let alone identify the characteristics of competent practice, this may be one reason why credentials have been developed at the speciifc level for distinct specializations: there are far more concrete parameters to work with and less risk. Certification of specializations within the information profession also allows for far more flexibility in dealing with otherwise competent individuals who may lack certain criteria by making the provision for equivalencies. This is especially important in providing for the upward mobility of paraprofessional library personnel in a manner that is not tied to each specific employer, as few non-employer-linked equivalency exams exist to our knowledge. Credentialing "criteria equivalencies" are also very important in fields or specializations where what constitutes sufficient preparation for practice is still undetermined because of the relative newness of the specialization. For those information professionals practicing in non-traditional, non-library settings, these equivalencies could very well act to ease the transition of these individuals into positions of responsibility when educational institutions have not yet sufficiently responded to a market where demand exceeds supply. However, a warning signal sounds when permanent credentials are granted based upon these "equivalencies" after the transition period has ended; these individuals, if not required to avail themselves of continuing education for "recredentialing", can quickly become professional anachronisms.

As stated earlier, when society moves toward perceiving the benefit of information services, developments of credentialing mechanisms for non-library information professionals should begin in earnest. It is more likely that the mechanisms to be adopted will be certification rather than licensure, given past developments in the information profession and their respective purposes. Certification has already been established as the credentialing mechanism for one kind of information professional, librarians, and licensure seems to have a greater tendency to operate in occupations where a tangible product/service is provided and/or the public perceives that greater, more immediate harm may befall them at the hands of an incompetent practitioner, e.g., medicine, law, etc. Licensure, because of the notion of public harm/good, has specific gatekeeper qualities which would also be detrimental to the non-library information professional job market in its transitional phase. For in this phase, what constitutes sufficient preparation for competent practice in these positions will still be quite fluid, as will the means by which these practitioners prepare themselves. Looking at certification, on the other hand, we see that it has tended to be responsive to specialization within the library market. Indications are that this type of flexibility and specificity will be necessary in the inital development stage of credentialing mechanisms for non-library information professionals, with "generic credentialing" perhaps following after a period of stabilization within the profession that permits concerted self-examination.

Although we cannot be sure of what will occur in the information profession in the future, we are certain that professional credentialing for information professionals can have its drawbacks, for example:

- restriction of the entry of otherwise qualified individuals into the profession (the gatekeeper function)
- lack of general recognition of equivalency paths for those individuals having unusual backgrounds and/or filling non-library information professional positions
- the dangerous potential of permanent certification, which, if it becomes a mimimum qualification, may predispose a changing profession to a greater degree of relative stagnation.

Positive aspects of credentialing for information professionals are:

- validity with regard to competent on-the-job performance
- responsiveness to new developments in the field and requiring responsiveness to change on the part of "credentialed individuals"

- permitting mobility of individuals into the profession and into positions of responsibility on the basis of competence rather than paper qualifications

- responsiveness to the job market and the capabilities of institutions providing education and training.

If future credentialing for information professionals is developed with the positive aspects in mind, it will doubtless be of value to the profession.

TABLE 1

SCHOOL LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE

STATE	CHARACTERISTIC							
	Degree Level	Teaching Certificate Required	Credit Hours in Library/ Information Science	Length of Validity	Requirements for Renewal, Recertification: Experience	Requirements for Renewal, Recertification: Education	Competency Based/ Practicum Required	Comments
Alabama								No information available
Alaska	Bachelor's	Type A - teacher ed. program	Unspecified	5 years		6 semester hours		Type A and Type C; type C does not require teacher ed.
Arizona	Bachelor's or Master's	Yes - Provisional, Basic, or Standard required	18 semester hours	6 years	Unspecified	Unspecified		K-12 endorsement on teaching certificate; level of lib. sci. hrs. unspecified
Arkansas	Bachelor's	No, but 18 sem. hrs. in Ed.	Secondary school: 18 semester hours	6 years	Unspecified	Unspecified		Specialist K-12 split into librarian (18 s.h.) and Media Specialist (12 s.h.)
California	Bachelor's	Calif. teaching credential	Unspecified	Unspecified	Unspecified	Unspecified		3 yrs. exp. as librarian; postgrad. year completed. w/in 5 years of employment
Colorado	Unspecified	Unspecified	Unspecified	5 yrs. ?	Unspecified	unspecified		
Connecticut	Grad work or Master's +	For Provisional, not for Standard	Minimum of 24 graduate sem. hrs. in "school media"	Unspecified	3 yrs. at Provisional level	MA in "sch. med." or MA + 30 sem. hrs. in "sch. media"		2 levels: 1) provisional, 2) standard
Delaware	Bachelor's	Yes	Varies from spec. in sch. librarianship in teacher ed. to ALA-MLS	Unspecified	Unspecified	Unspecified		See Woellner p. 44 for specifics of professional preparation

TABLE 1

SCHOOL LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC							
					Requirements for Renewal, Recertification			
	Degree Level	Teaching Certificate Required	Credit Hours in Library/ Information Science	Length of Validity	Experience	Education	Competency Based/ Practicum Required	Comments
District of Columbia	See Comments	No	See Comments	Unspecified	Unspecified	Unspecified		Elementary: BA+12-18 s.h. in lib. sci. Secondary: MA+ 30 hrs. in lib. sci.
Florida	Bachelor's	Teacher Certificate Exam	Major in ed. media or 24 s.h. in ed. media	Unspecified	Unspecified	Unspecified		Called "Educational Media Specialist"
Georgia	Bachelor's or Master's?	Unspecified	Unspecified	Unspecified	Director of Media Centers -5th yr. of ed.			Certification test req. for Media Specialist at Master's level
Hawaii	Bachelor's	Unclear; several levels of specialist certificate	Unspecified	Unspecified	Unspecified	Unspecified	School Librarian	School Librarian or Media Specialist; Practicum in K-12 setting required for media specialist or school librarian
Idaho								No information available
Illinois	Bachelor's	Yes	Library Science-media 18 grad. sem. hrs.	Unspecified	Unspecified	Unspecified		3 levels of progressively responsible certification that build on each other
Indiana								No information available
Iowa	Bachelor's	Unclear	Graduate or undergrad. major in school lib. work	10 years	Renewable under prescribed conditions, but no info. available			Endorsements for school librarian or ed. media spec.; Div. of Lib. Services requires MLS and prof. cert.
Kansas	Unspecified	Unspecified	Secondary sch.-24 sem. hrs.; Elem. school-15 sem. hrs.	Unspecified	Unspecified	Unspecified		Very little info., [illegible]ely vague

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TABLE 1

SCHOOL LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC							
	Degree Level	Teaching Certificate Required	Credit Hours in Library/ Information Science	Length of Validity	Requirements for Renewal, Recertification		Competency Based/ Practicum Required	Comments
					Experience	Education		
Kentucky	Bachelor's or Master's	No	Varies	Varies	Various paths and levels of certification			Approved. Program approach vs. specific requirements; see Woellner, p. 94-95
Louisiana	Unspecified	Yes	21 sem. hrs.	Unspecified	Unspecified	Unspecified		Little information available
Maine	Bachelor's or Master's	Varies	Varies; when specified, not less than 36 grad sem. hrs.	Unspecified	Unspecified	Unspecified		3 plans w/various requirements at various degree levels
Maryland	Bachelor's or Master's	No	Associate- 18 sem. hrs; Generalist and Specialist - Masters or 36 hrs.*	Not clear	Unspecified	Unspecified	Competencies specified in cert. requirements	Several progressively responsible levels - all require practicum or years of professional experience * Credit hours not clearly required to be in library science: broad field of media ed.
Massachusetts	Unspecified	Yes	30 sem hrs "pre-practicum"- subject discipline unspecified	Unspecified	Unspecified	Unspecified	Standards in addition to reqs. - skills, knowledge and attitudes	Unified. Media specialist - covers both school librarian & A-V media specialist
Michigan	Bachelor's	Yes	Major-30 sem. hrs or minor- 20 sem. hrs.	Unspecified	3 yrs. teaching experience	18 sem. hrs. appropriate credit		Different levels - provisional, continuing, or K-12 endorsement

TABLE 1

SCHOOL LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC							
					Requirements for Renewal, Recertification			
	Degree Level	Teaching Certificate Required	Credit Hours in Library/ Information Science	Length of Validity	Experience	Education	Competency Based/ Practicum Required	Comments
Minnesota	Bachelor's	Yes	10 sem. hrs. in audio-visual courses	Unspecified	Unspecified	Unspecified		Called Audio-Visual Director; 2 years teaching experience required
Mississippi	Varies-BA through PhD	No	Varies - minimum of 30 sem. hrs.	Varies 5 yrs., 10 yrs., life	Unspecified	Unspecified		4 progressively responsible levels from BA through PhD
Missouri	Bachelor's	Yes	18 sem. hrs.	Unspecified	Unspecified	Unspecified		Req. given for Librarian; see also Instructional Media Technologist
Montana	Bachelor's	Yes	Min. of 20 sem. hrs. in K-12 lib. sci	Unspecified	Unspecified	Unspecified		Little information available
Nebraska								No information available
Nevada								No information available
New Hampshire	Several levels-Bachelor's or Master's	No	BA or MA in media - credit hrs. unspecified	Unspecified	Unspecified	Unspecified	Can be certified on basis of competencies by Board of Examiners	3 progressively responsible levels - lowest requires 2 yrs. of ed. and review by Bd. of Examiners
New Jersey	Bachelor's or Master's	Yes	Varies from 18 undergrad. sem. hrs. to 30 grad. hrs.	Not clear	Unspecified	Unspecified		2 levels - Associate Ed. Media Specialist & Ed. Media Specialist

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TABLE 1

SCHOOL LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC							
	Degree Level	Teaching Certificate Required	Credit Hours in Library/ Information Science	Length of Validity	Requirements for Renewal, Recertification: Experience	Requirements for Renewal, Recertification: Education	Competency Based/ Practicum Required	Comments
New Mexico	Bachelor's	Yes	24 sem. hrs. in library media courses	Unspecified	Unspecified	Unspecified		
New York	Bachelor's or Master's	No	Varies: min. of 36 sem. hrs.	5 yrs. or permanent	Unspecified	Unspecified	Practicum req. at both levels	2 levels - provisional (valid for 5 yrs., and permanent - requires 2 yrs. of experience
North Carolina	Varies	Yes	Varies- Unspecified	5 yrs.	Unspecified	Unspecified	Demonstrated competence required; exam required	2 levels - Media Coordinator (competency based), Media Specialist - req. Master's degree
North Dakota	Bachelor's or Master's	Educator's Prof. Cert./ Teacher's Cert.	Varies- minimum of 16 sem. hrs.	2 yrs., renewal for 5 yrs.	2 yrs. teaching experience			Several kinds of certification; Master's degree (not nec. MLS) required for Media director certification
Ohio	Bachelor's	Yes	20 sem. hrs. for elem.; 30 sem. hrs. for sec.	Unspecified	Experience or 6 semester hours		Practical exp. as part of student teaching for sec. level	2 levels - elementary school and secondary school
Oklahoma	Bachelor's	Yes for Professional Cert.	24 sem. hours	7 yrs. for Prof. Cert.	Unspecified	Unspecified	Student teaching required	See also Audio-Visual Specialist (Standard Certificate)

TABLE 1

SCHOOL LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC							
	Degree Level	Teaching Certificate Required	Credit Hours in Library/ Information Science	Length of Validity	Requirements for Renewal, Recertification		Competency Based/ Practicum Required	Comments
					Experience	Education		
Oregon	Bachelor's	Not clear	Basic: 21 qtr. hrs.; Standard: 36 qtr. hrs.	Unspecified	Unspecified	Unspecified		K-12 Educational Media Subject Matter Endorsement
Pennsylvania	Unspecified	Yes	No info. available	No info. available	3 yrs. plus 24 credit hours for permanent certificate		Little info available	Sources unclear; needs clarification
Rhode Island	Bachelor's or Master's	No	Provisional: 18 sem. hrs.; Professional: 24 sem. hrs.	Prov - 6 years; Prof. - life	Provisional certificate not renewable - Prof. cert. req. Master's degree		6 sem. hrs. practice teaching	2 levels: 1) Provisional; 2) Professional
South Carolina	Bachelor's or Master's	No	30 sem. hrs.; req. courses vary for level of cert.	Unspecified	Unspecified	Unspecified	Nat. Teacher Exam; practicum in media center	3 levels: 2 at Bachelor's level, Media Supervisor at Master's level
South Dakota								No information available
Tennessee	Bachelor's	Yes	For elementary school: 27 qtr. hrs.	Unclear	Unclear	Unclear		Little information available
Texas								No information available
Utah	Master's degree or credit hrs.	Yes	55 grad. qtr. hrs. (instructional media)	Unspecified	Unspecified	Unspecified	3 yrs. exp. in ed., 1 yr. of which in prof. media position	Called "Instructional Media Endorsement"

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TABLE 1

SCHOOL LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC							
	Degree Level	Teaching Certificate Required	Credit Hours in Library/ Information Science	Length of Validity	Requirements for Renewal, Recertification		Competency Based/ Practicum Required	Comments
					Experience	Education		
Vermont	Unspecified	Unspecified	Unspecified	Unspecified	Unspecified	Unspecified	1 sem. of practicum or 1 yr. general teaching experience	Requires knowledge of library/media subject vs. credit hrs; see Headliner
Virginia	Unspecified	Unspecified	24 sem. hours	Unspecified	Unspecified	Unspecified	3 sem. hrs. in a school library, clinical experience	Little information available
Washington	Bachelor's	Yes	Minimum of 12 sem. hours	Unspecified	Unspecified	Unspecified	"Demonstrated competence" required	"Endorsement on a Regular Teaching Certificate"
West Virginia	Unspecified	Yes?	24 sem. hrs.	Unspecified	Unspecified	Unspecified		Little information available
Wisconsin	Unspecified	"Eligibility for teacher's license"	22 sem. hrs.	Unspecified	Unspecified	Unspecified	Eligibility for teaching licenses can be gained via prof. ed. including field exp.	Coursework required differs for elementary and secondary school librarians
Wyoming	Bachelor's	Yes	24 sem. hrs.; 15 in lib. sci.; 9 in instructional media	Unspecified	Unspecified	Unspecified		Audiovisual certification requires only 12 semester hours

TABLE 2

PUBLIC LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE

STATE	CHARACTERISTIC						
	Name/ Position Certified	Degree Level	Levels of Certification, Comments	Credit Hours in Library/ Information Science	Length of Validity	Purpose	Comments
Alabama							No information available
Alaska							No information available
Arizona	Head librarians of county libraries	Bachelor's or Master's	Master's level-1 yr. of public lib. exp. Bachelor's level-2 yrs. of public lib. exp.	MLS or BA plus 15 credit hours in library science	Unspecified	Unspecified	From Certification of Public Librarians in the U.S. (Coe*) (1979); no update available
Arkansas							See source cited above - law re. head librarians of county libraries is inactive
California	Mandatory - head librarians of county libraries	Bachelor's plus-see credit hours		ALA-MLS or 24 graduate units in library science	5 years, renewable	Unspecified	3 years of experience, written and oral exam required from Coe, no update available
Colorado	No certification law or plan	5th year of training or experience	N/A	N/A	N/A	Public libraries receiving state grants in aid	No certification, but Personnel Standards from Coe, no update available

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* Coe = American Library Association, Library Administration and Management Association. Certification of Public Libraraii 'n the United States. 3rd edition. Eduted by Mary J. Coe. Chicago, Illinois: ALA-LAMA, 1979.

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TABLE 2

PUBLIC LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC						
	Name/ Position Certified	Degree Level	Levels of Certification, Comments	Credit Hours in Library/ Information Science	Length of Validity	Purpose	Comments
Connecticut	Head librarian of public library	Varies with grade of certification	7 grades-from 2 yrs. of college + 1 year experience through ALA-MLS + 6 yrs. experience	Varies with grade from 8 semester hours to ALA-MLS	Unspecified	Means to improve library services and increase professional qualification	"Permissive plan"
Delaware	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available
District of Columbia							No information available
Florida	No certification plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available. See comment, p. 9 re. public libraries receiving State and Federal funds
Georgia	Professional positions in public and institutional libraries	Unclear, several levels	4 professional levels - progressively higher levels of education required	Unspecified	Prov. Graduate: 5 yrs., renewable once. Others unspecified	Public Libraries serving populations of 5,001 and up	From Coe, no update available
Hawaii	No certification plan	N/A	N/A	N/A	N/A	N/A	Public librarians are State Civil Service-ALA-MLS required; from Coe, no update available
Idaho	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, still correct as of 7/83

TABLE 2

PUBLIC LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC						
	Name/ Position Certified	Degree Level	Levels of Certification, Comments	Credit Hours in Library/ Information Science	Length of Validity	Purpose	Comments
Illinois	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, still correct as of 7/83
Indiana	Mandatory for heads of public and institutional libraries	Varies with certification level	5 levels which vary according to size of population served	Varies from 9 semester hours in library science to ALA-MLS	Lifetime	Attempt to ensure quality service	From Coe, still correct as of 7/83
Iowa	No library certification program	N/A	N/A	N/A	N/A	N/A	
Kansas	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available
Kentucky	Full-time professional persons in public libraries	High School or Bachelor's	Professional, Library Experience, Temporary	Library Experience: minimum of 12 semester hours; Professional: 21 semester hours	Professional-5 yrs., 3 sem. hrs./ 10 workshops needed for renewal. Library experience-3 yrs. Temporary-1 yr.	Unspecified	Information received is not clear
Louisiana	Heads of public libraries	B.S. in library science or ALA-MLS	Executive-3 yrs. post-degree executive public library experience	See degree level	Executive-5 yrs., renewable	Unspecified	From Coe, no up[illegible] available

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TABLE 2

PUBLIC LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC						
	Name/ Position Certified	Degree Level	Levels of Certification, Comments	Credit Hours in Library/ Information Science	Length of Validity	Purpose	Comments
Maine	Librarians-in-charge of public libraries	Varies from high school to MLS	5 grades (7 levels) varies with size of population served	Varies from 6 credit hours to MLS	All: 5 yrs., renewable	Voluntary-to improve library service and aid and encourage increasing professional qualifications	From Coe, no update available
Maryland	Professional positions in county libraries	Bachelor's	Various certificates with same requirements	30 sem. hrs. from school approved by Md. State Board of Ed. or ALA	3 yrs., first renewal for 4 yrs. then for 6 year period	Unspecified	From Coe, no update available
Massachusetts	Heads of municipal libraries	ALA-MLS	2 levels-information given for professional level only	See degree level	Life	Prerequisite to receive direct state aid to public libraries	ALA-MLS, or completion of exam or certificate from another state; from Coe, no update available
Michigan	Professional positions in public libraries	Varies with level	7 progressively responsible levels which vary	Varies with level according to size of population served	Unspecified	For personnel standards applied re. distribution of state aid grants	Many levels from ALA-MLS + experience to "Certificate of library experience"; from Coe, no update available
Minnesota	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available
Mississippi	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available

TABLE 2

PUBLIC LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC						
	Name/ Position Certified	Degree Level	Levels of Certification, Comments	Credit Hours in Library/ Information Science	Length of Validity	Purpose	Comments
Missouri	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available
Montana	N/A	N/A	N/A	N/A	N/A	N/A	Voluntary certification plan is inactive; from Coe, no update available
Nebraska	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available
Nevada	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available
New Hampshire	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	"Voluntary certification plan is undergoing revision" from Coe, still correct as of 7/83
New Jersey	Professional public librarian	Unspecified	Unspecified	Graduate of library school accredited by NJ Board of Education	Unspecified	Library supported in whole or in part by public funds serving a population of 10,000 or more	Vague, little information
New Mexico	Chief librarian in library supported by public funds (except public school or county law libraries)	Varies with grade	3 levels plus temp. certificate	Varies from ALA-MLS to 9 semester hours in library science with size of population served	Unspecified	See Comments	Equivalency exam for Grade II in lieu of educat[illegible] available; from Coe, no [illegible] available "No public fund[illegible] be paid to any library faili[illegible] comply with the required provi[illegible] of the certification laws." [illegible], p.37

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TABLE 2

PUBLIC LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC						
	Name/ Position Certified	Degree Level	Levels of Certification, Comments	Credit Hours in Library/ Information Science	Length of Validity	Purpose	Comments
New York	Professional positions in public, free association, and Indian libraries	Master's	Prof. cert.- ALA-MLS or equiv. and 3 yrs. of exp. Conditional- non-U.S. ed. equiv. to lib. sci. degree from approved program	5th yr. of study (MLS or equivalent)	Prof.- permanent Cond.-2 yrs., renewable for 2 yrs.	Unspecified	Information received is not clear
North Carolina	Public librarians	MLS	Coursework in public library administration mandatory	18 sem. hrs. within MLS	Unspecified	Best public library service responsible use of state funds; prof. dev. beyond minimum	Use of NC Chapel Hill Comp. Exam in Library Science for out-of-state uncertified applicants
North Dakota	N/A	N/A	N/A	N/A	N/A	N/A	Certification law inactive from Coe, no update available
Ohio	Head librarians of county district libraries	Varies- 2 of 3 levels req. ALA-MLS	Permanent- 5 yrs. adm. exp. in public library; Provisional-no experience; Temp.-no MLS	Permanent + Provisional- MLS. Temporary- min. of 12 credit hrs.	Permanent- life; Provisional-5 yrs., renewable; Temporary-3 yrs., renewable	Assurance of quality service	From Coe, no update available
Oklahoma	No certification law or plan	N/A	N/A	N/A	N/A	N/A	Admin. of State aid & personnel standard mechanisms unclear from Coe, no update available

TABLE 2

PUBLIC LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC						
	Name/ Position Certified	Degree Level	Levels of Certification, Comments	Credit Hours in Library/ Information Science	Length of Validity	Purpose	Comments
Oregon	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available
Pennsylvania	Professional public librarians	Varies with level from 2 yrs. college to MLS	Professional, Provisional, Library assistant	Varies with level from 9 credit hours in library "service" to MLS	Life	Minimal service standards; recognition of qualified persons	"Library assistant"-professional certification for director of unit in system that serves between 5,000 and 15,000 people
Rhode Island	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available
South Carolina	Professional public librarian, pre-prof. public librarian	Bachelor's or Master's	Professional-ALA-MLS, Pre-professional-Bachelor's	Pre-professional-18 hours in library science, business science, or subj. spec.	Unspecified	Unclear	Relationship to receipt of state and/or federal funds not mentioned
South Dakota	Public librarians?	Varies from high school to MLS	6 progressively responsible grades	Varies from 0 to ALA-MLS	Unspecified, but renewable	Personnel standards according to size of population served for LSCA funds	Various experience equivalencies; must be members of South Dakota Library Association; from Coe, no update available
Tennessee	N/A	N/A	N/A	N/A	N/A	N/A	Certification law inactive from Coe, no update available

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TABLE 2

PUBLIC LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC						
	Name/ Position Certified	Degree Level	Levels of Certification, Comments	Credit Hours in Library/ Information Science	Length of Validity	Purpose	Comments
Texas	County Librarian	Varies from high school to MLS with grade	Grades I, II, and III	Unspecified	Grade I-permanent; II and III-2 yrs, renewable with 3 semester hours or 20 hours CE	Not given	Grade I-MLS, Grade II-25,000 or fewer population served; Grade III-10,000 or fewer served
Utah	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Coe-"State Library Commission is developing certification...." still current as of 7/83
Vermont	Public librarians without library school degree	Unspecified	Voluntary	150 classroom hrs. of institutes and workshops - must include 4 basic topics	Unspecified	Appears to be a profess. development mechanism	Automatic certification of persons having MLS
Virginia	Full-time professionals in public and academic libraries	ALA-MLS or equivalent	"Granting of temporary or provisional licenses" in emergency conditions	MLS or equivalent	Permanent	Required for receipt of public funds; assurance of quality service	From Coe Under review as of 7/83
Washington	Full-time professionals in public and academic libraries	ALA-MLS or equivalent		See degree level	Unspecified	Mandatory for public libraries serving 4,000 or more	From Coe, under review as of 7/83 Possibility of certification by exam., development of CE requirements for renewal, other changes

TABLE 2

PUBLIC LIBRARIAN CERTIFICATION CHARACTERISTICS BY STATE (Continued)

STATE	CHARACTERISTIC						
	Name/ Position Certified	Degree Level	Levels of Certification, Comments	Credit Hours in Library/ Information Science	Length of Validity	Purpose	Comments
West Virginia	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available
Wisconsin	Public librarians	Varies from high school to MLS	4 progressively responsible grades	Varies from home-study course to ALA-MLS	5 yrs, CE required for renewal	Personnel standards according to size of population served for receipt of public funds	From Coe, no update available
Wyoming	No certification law or plan	N/A	N/A	N/A	N/A	N/A	From Coe, no update available

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APPENDIX 3

AN EXAMPLE OF THE RELATIONSHIPS BETWEEN COMPETENCIES, PERFORMANCE, EFFECTIVENES AND VALUE: AN EXAMPLE OF THREE SPECIAL LIBRARIES

AN EXAMPLE OF THE RELATIONSHIPS BETWEEN COMPETENCIES, PERFORMANCE, EFFECTIVENESS AND VALUE: AN EXAMPLE OF THREE SPECIAL LIBRARIES

In Chapter 2 of this report we set forth a conceptual framework of the information environment and how information professionals and their competencies fit into this environment. In this appendix we give a quantitative example of how two competencies of one information professional specialty relate to performance which in turn relates to effectiveness and value. Here we follow the example given in Chapter 2 concerning libraries as a work setting, reference as a function, reference searching as a service, conducting the search as an activity, a reference librarian as a resource component, competencies as a characteristic of the resource components, and the reference librarian's subject knowledge and skills in searching as two examples of components of competencies. The examples are drawn from a recent KRI study funded under grants by the Department of Energy, Office of Scientific and Technical Information, and the National Science Foundation, Division of Information Science and Technology.* We felt that the example would be useful to indicate why we chose to employ the conceptual framework utilized in this project.

The data employed in the analysis were collected from three research laboratories that are largely funded by the Department of Energy. Thus, the results might be considered biased. However, the study has been replicated in two new environments with similar results. The three libraries served a total of 5,188 professionals of whom about one-half were scientists and engineers engaged in research and development. These professionals read an enormous amount of material (e.g., an annual average reading of 99 journal articles, 44 technical reports and 15 books). The three libraries are also extensively used (an average of 25 times per year per professional) and much of the reading comes from library materials (i.e., 53 percent of journal articles, 39 percent of technical reports, and 39 percent of book readings).

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* The report, A Study of the Value of Information and Effect on Value of Intermediary Organizations, Comprehensiveness of Services and Products, and Comprehensiveness of the EDB is part of a larger study on Statistical Indicators of Scientific and Technical Communication. [King et al, 1984]. It is partially published in The Use and Value of Special Libraries, D.W. King and J.M. Griffiths, Knowledge Industries Publications, Inc., White Plains, New York, scheduled for publication in 1985.

Using an economic approach described by us earlier, it was found that the values attributable to library services averaged about $3,200 per professional in terms of what they pay for information provided by the special libraries and $27,700 per professional in terms of savings of user time and equipment as a result of having read and used information from library materials. The value of the library services and materials was also determined by the value that would be lost if they no longer existed. Evidence suggests that the value of the libraries would be about $600 per professional in terms of what they pay and $5,400 in terms of savings. Thus, it would appear that these special libraries contribute nearly 10 percent to the productivity of the organizations' professional staffs. Below we demonstrate that there are some linkages between librarian competencies and that value.

An attempt is made in this appendix to relate two reference librarian competencies to the librarians' performance, their performance to effectiveness, and their performance to value. All of the analyses deal with online and manual bibliographic searching performed upon request by users. The librarian competencies investigated include their knowledge of the subject in which specific searches are performed and their technical searching skills (i.e., facility with and knowledge of search techniques and vocabulary). Performance is measured by relevance of search output, number of items retrieved and timeliness of response to search output. Effectiveness is measured in terms of user satisfaction and, in turn, to number of searches performed per month. Also, a trade-off analysis is performed in which user time (i.e., value in terms of what users pay for the service) is determined as a function of response time and quality of search in terms of relevance of output.

The premise behind the relationships below are that:

Level of knowledge, skills and attitudes (competencies)
⇩
Affects the quality of searching and speed of response (performance)
⇩
Affects the extent of use of the search services (effectiveness)
⇩
Affects the cost and performance of the users work (value)

Below we discuss each of the linkages represented by arrows above.

Relationship of Two Reference Librarian Competencies to Performance

The first linkage is between the competencies and performance. The searcher's knowledge of the subject field is ranked from one to five, with a "one" indicating the searcher is not well qualified as to subject knowledge and a "five" indicating the searcher is very well qualified, with two to four being intermediate levels. Performance was measured by the relevance of items identified for a specific search. The users of the specific searches were asked to rank the searchers' subject knowledge qualifications and their performance in terms of relevance of items identified.* The relationship between subject knowledge and performance is depicted in Figure 3-1 showing that ranking of the searcher's knowledge at level two, on the average, yields a low performance (i.e., satisfaction score of two for relevance of search output). However, as the ranking of searcher's knowledge increases, the performance increases to the point where a ranking of searcher's qualification in terms of subject knowledge of five yields an average performance of 4.8 rank of relevance of search output.

Another competency is the skill of a searcher in conducting a search. Here skill was ranked from "not at all skillful" (one) to "very skillful" (five). Performance was also judged in terms of the ranked relevance of references presented in the search output. Again it was found that increased rankings of searcher's technical skills yield increased performance in terms of relevance of output (Figure 3-2). However, the levels of performance are generally not as high as those observed with the searcher's knowledge of the subject field searched. Thus, one could conclude that the searcher's subject knowledge probably, or at least perceived to be, more important than the searcher's technical skill (although this observation could also be a result of the user's expertise in evaluating subject knowledge as opposed to technical searching skill).

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* Perhaps better means of observing the competencies would be a person's university grades, or measurement by an expert in the field and not the user. However, there are good arguments for either method.

FIGURE 3-1 Relation of Search Performance Searcher's Knowledge of Subject Field

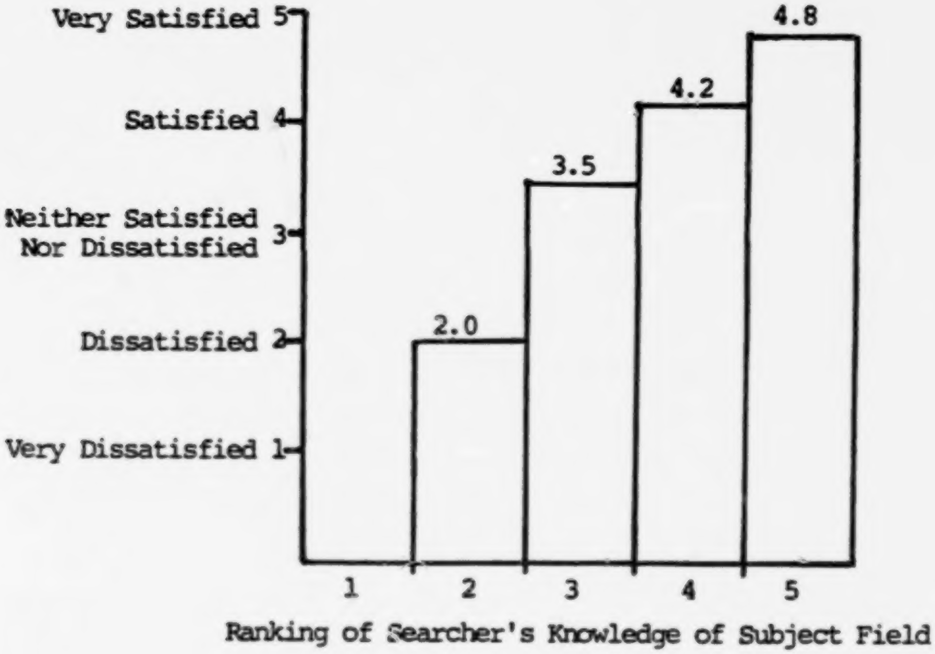
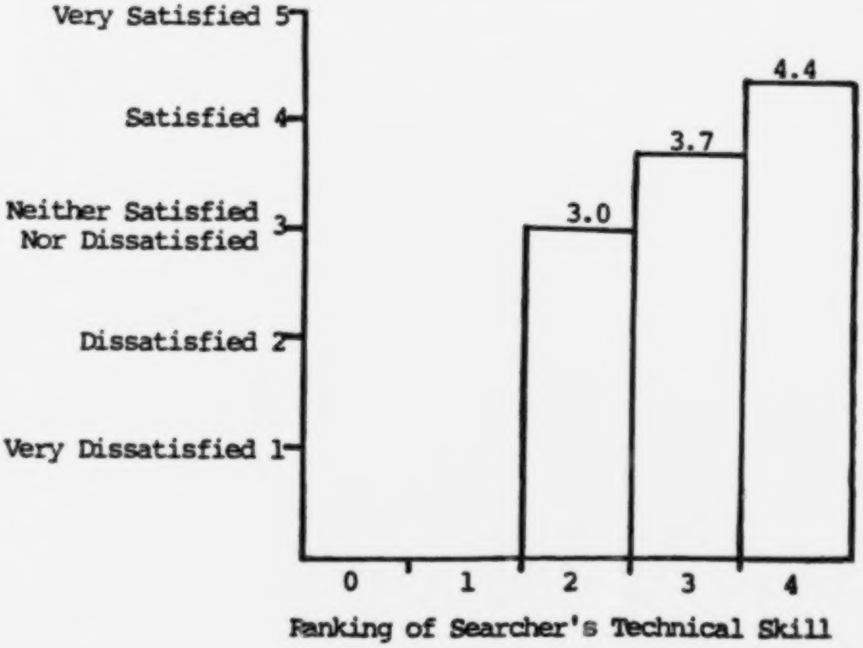


FIGURE 3-2 Relation of Search Performance Searcher's Technical Skill



Another measure of performance is the speed of delivery of a search result. Obviously, the ability to deliver quickly depends on a searcher's knowledge and skills. However, it also depends to a large degree on attitude. A strong personal and professional attitude will help in making sure a result is delivered on time. We did not relate competence to speed of delivery. However, as shown below, we did relate speed of delivery to number of uses.

Relationship of Performance to Effectiveness

An important relationship is between speed of delivery (performance) and satisfaction with speed of delivery (effectiveness). Figure 3-3 shows that the users are dissatisfied (2.0) if the search results are delivered more than five days beyond the required time indicated by the user. On the average, they are satisfied (4.2), if the delivery is not over five days beyond the required time. If the results are delivered ahead of the required time, the users, on the average, are close to being very satisfied (4.8).

In this example, we also show that amount of use of library services is related to the three measures of performance: relevance of output, number of references retrieved and timeliness of responses. First we show that average number of online searches performed per year for users is related to satisfaction with relevance of output. The chart in Figure 3-4 shows that users who are dissatisfied with relevance of output search, on the average, ask for searches only 1.5 times per year. Whereas, users who are very satisfied with relevance of output ask for searches an average of 3.2 times per year. Referring back to the searcher's knowledge of the subject field searched, a low ranking (2) resulted in the user being dissatisfied and a high ranking (5) yielded a score close to being very satisfied. Thus, one might convert low searcher knowledge to 1.5 searches per year and high searcher knowledge to about 3.0 searches per year. These numbers, in turn, could be converted to value since fewer (or greater number of) searches directly affect use of primary information, and hence, value.

Similarly, the average number of online searches requested per year is related to satisfaction with number of references retrieved (Figure 3-5) and satisfaction with timeliness of search response (Figure 3-6). However,

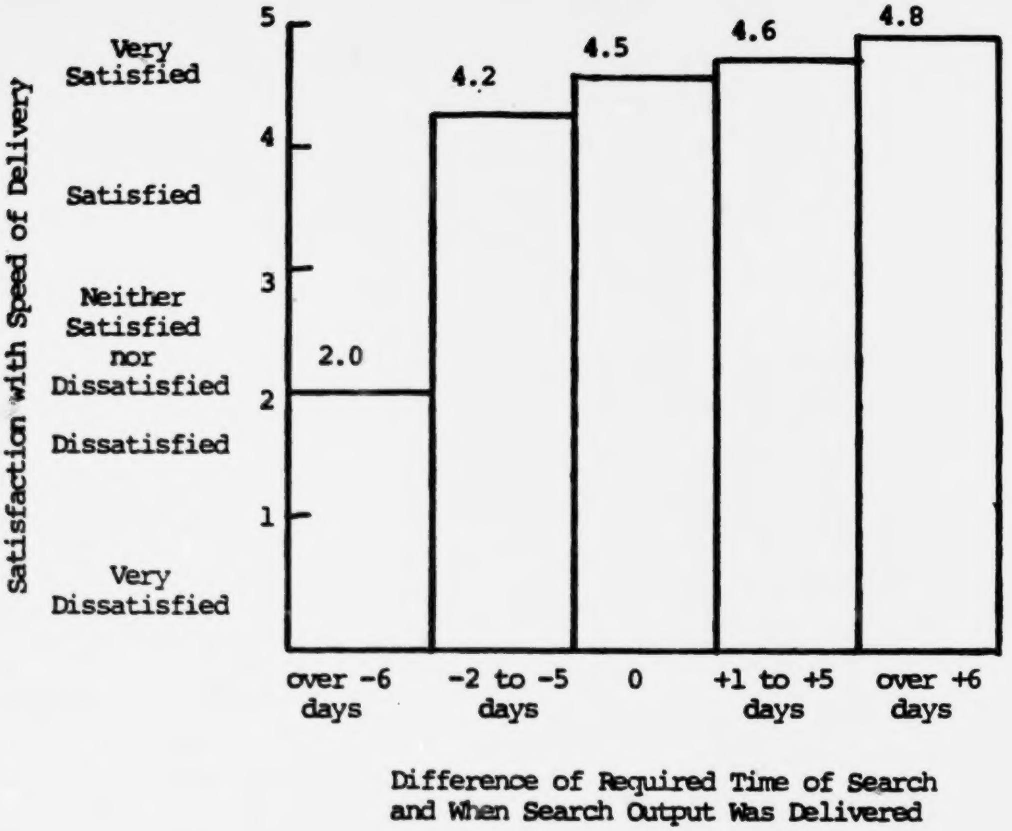


FIGURE 3-3 Relation of Search Effectiveness as a Function of Speed of Delivery

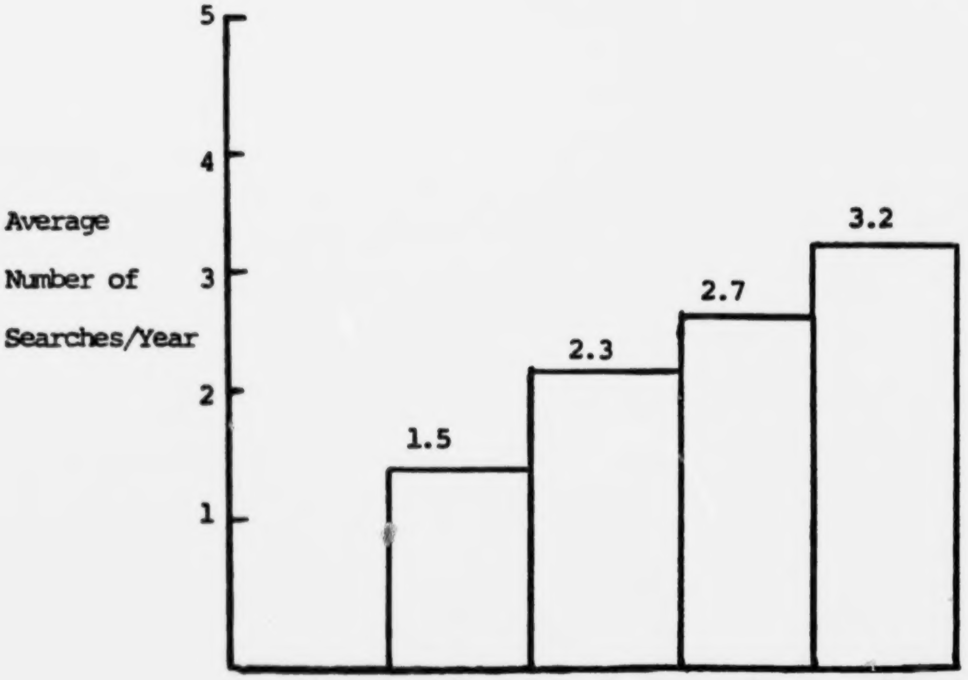


FIGURE 3-4 Relation of Number of Searches Performed as a Function of Performance in Terms of Relevance

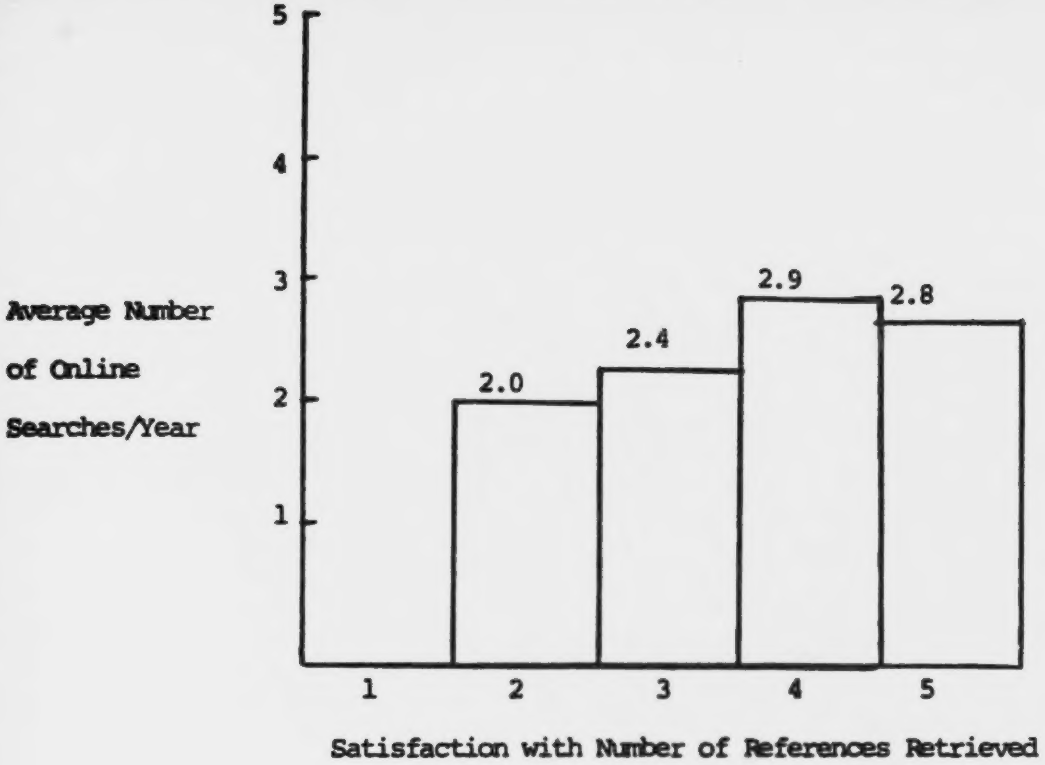


FIGURE 3-5 Relation of Searches Performed as a Function of Performance in Terms of Number of References Retrieved

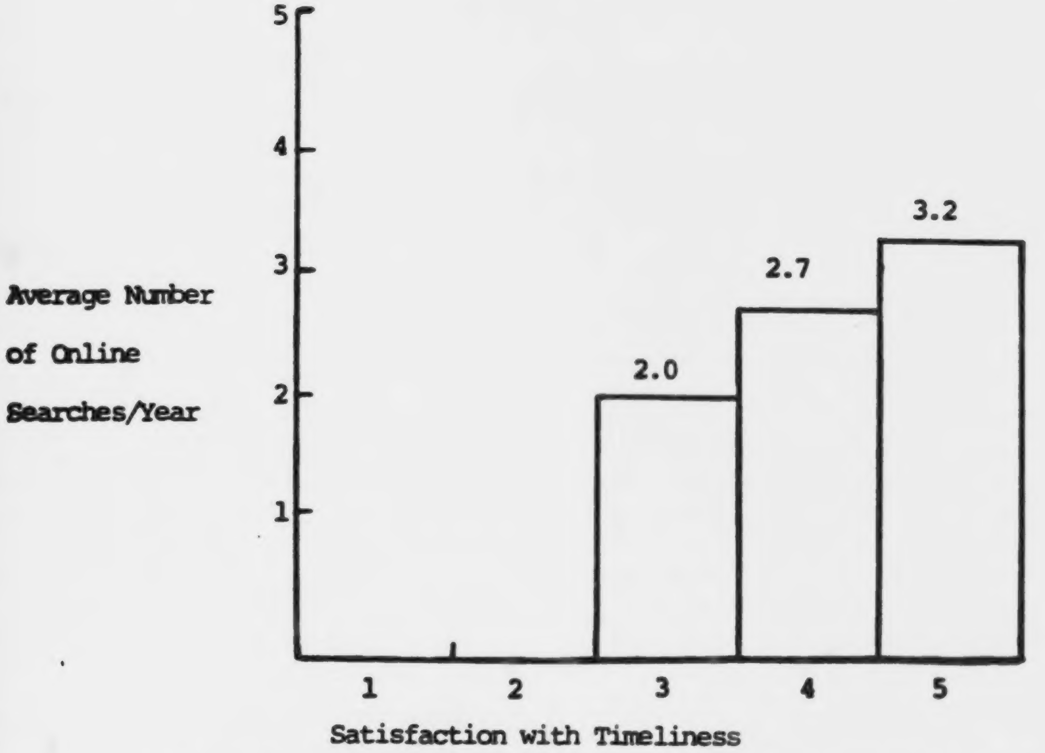


Figure 3-6 Relation in Terms of the Searches Performed as a Function of Performance in Terms of Timeliness

these relationships do not appear to be as strong as the relationship of number of searches performed and relevance of search output. For example, the difference in average number of searches performed per year for those who are generally dissatisfied and very satisfied is 2.0 searches per year and 2.8 searches per year, respectively, thus showing a difference in the average of less than one search per year. As one would expect, the average number of searches performed per year increases from those who are neither satisfied nor dissatisfied (2.0 searches per year) to being very satisfied (3.2 searches per year).

Tradeoff of Performance and Value

In the previous sections we were able to demonstrate a relationship between number of searches requested and, independently, performance attributes such as timeliness and quality of online searching. The problem is that one does not know the relative contribution these performance attributes have when considered together. Below we give an analysis of how timeliness and quality together affect the value of searching expressed in terms of user time (i.e., their willingness to pay). The analysis is performed using a statistical method called conjoint analysis. This marketing research method permits one to assess combinations of levels of relevance and speed of delivery in terms of how they affect what user's pay (in time) for the service.

One can see in Figure 3-7 that users would pay $65 for searches that have high relevance of responses and are delivered in one day. If we lower the quality to medium relevance of responses, the users would pay only $50. If the speed of delivery of these searches is increased to over three days, the users would $30 less ($49 minus $19). Generally, users would pay more for online searches than manual searches, except when they are of low quality or have slow response times.

This model provides a potentially useful tool for relating performance to value of information services. Also, if the performance increases the number of uses that will be made of a service, one can conclude that the total value derived will also increase. (The value above is merely an average value per search). Thus, there is some possibility of developing a model of competencies, performance, effectiveness and value.

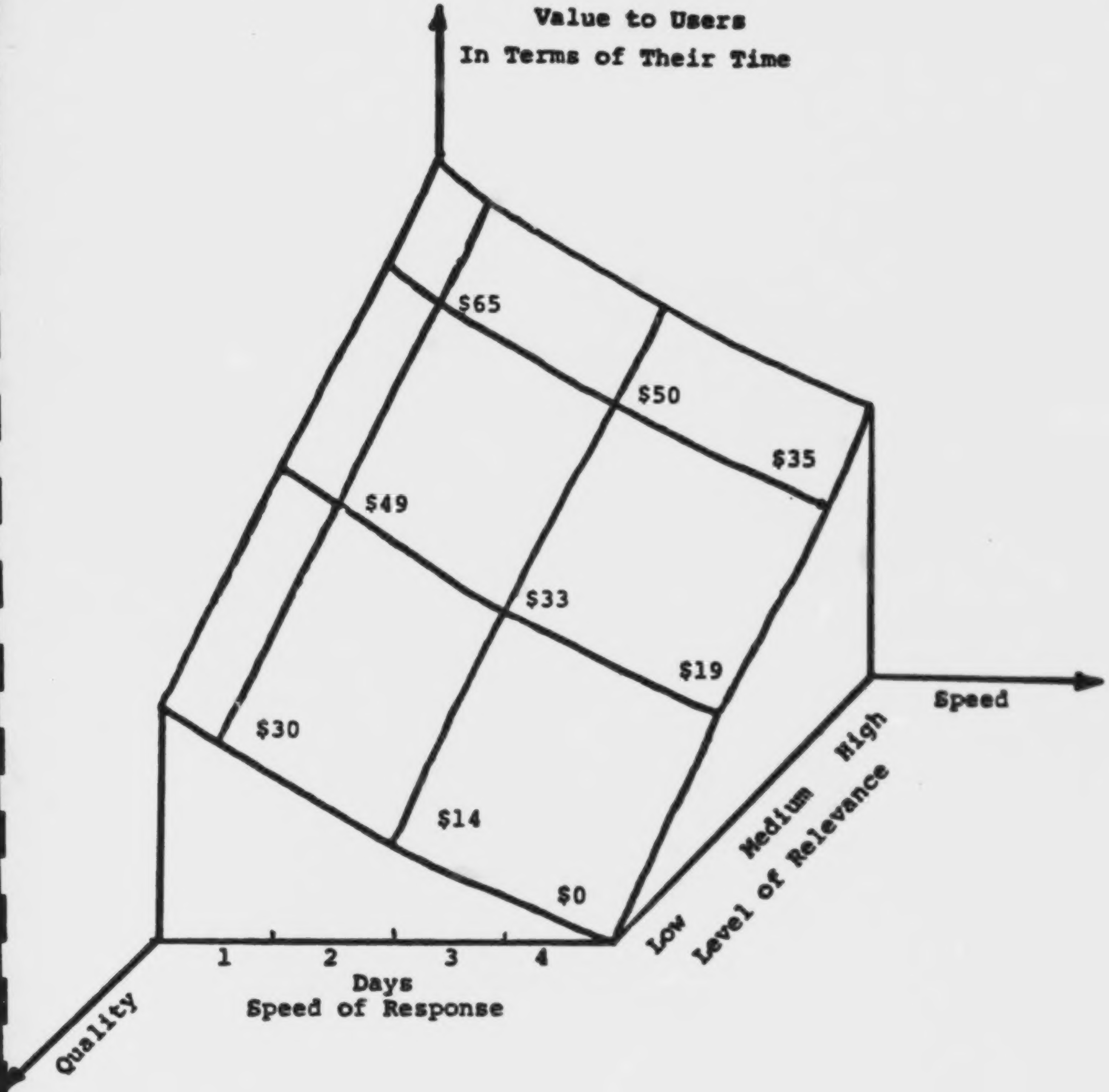


Figure 3-7 Relationship of Value of Online Searches to Level of Relevance and Speed of Response

It is recognized that the relationships above are crude, but nevertheless rather revealing. We hope by showing quantitative results that it will become clear why we felt it necessary to identify, define and validate information professional competencies in the overall framework described previously in Chapter 2 of this report.

APPENDIX 4

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Zimmerman, Glen. "The Job Validation Project at the Library of Congress: A Status Report." Paper presented at the Competency Development and Validation Program of SCOLE, American Library Association Annual Conference, Los Angeles, California, June 28, 1983.

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Zweizig, D.L., and McClure, Charles. "Issues in Training Practitioners for Library Planning." *Journal of Library Administration* 2(2/3/4): 235-250 (Summer/Fall/Winter 1981).

APPENDIX 5

ANNOTATED BIBLIOGRAPHY

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LIBRARY EDUCATION/TRAINING 5-1

LIBRARY/INFORMATION COMPETENCIES 5-11

CERTIFICATION 5-17

Association of American Library Schools. Library/Education Statistical Report 1982. State College, Pennsylvania: Association of American Library Schools, 1982.

This report is a good source of general statistics on library/information science education in North America, although its coverage of Bachelor and Doctoral degree programs is not as thorough as for Master's degree programs. While this source does not discuss competencies or even specific issues in library/information science education, the sections on curriculum and continuing education are especially valuable for providing background information. (The reader is referred specifically to p. C-15, portions of program declared obsolete/cancelled, and pp. CE-16 and CE-17 which describe personnel target groups and subject emphasis). As this item is published periodically, it should be monitored for trends and changes in professional education that could shed light on competencies needed both now and in the future.

Bell, Jo Ann. "The Role of Library Schools in Providing Continuing Education for the Profession." Journal of Education for Librarianship 19(3): 248-259 (Winter 1979).

This article states: "The descriptions of programs executed by schools to accomplish their continuing objectives are useful for identifying activities which are appropriately considered as continuing education efforts" (pp. 249-250). However, it presents data gathered by means of a 1977 survey of library schools that cover only such questions as relative importance of continuing education, courses taught on and off-campus, courses taught at convenient times, etc. Bell does not address the question of subject content of continuing education activities offered at library schools and whether these offerings fulfill library/information professionals' needs.

Cain, Carolyn L. "Media Specialists and the Quest for Lifelong Learning." School Library Journal: October 1982, pp. 109-113.

Cain treats the necessity for practitioners to take active responsibility for their own continuing education. She examines means by which media specialists might assess their learning needs and factors involved in doing this. While her article does not discuss specific competencies or continuing education topics, it does mention Knowles' framework for library competencies (p. 110). The author also addresses specific strategies for identifying areas where one needs additional background, stating that "the literature shows increasing interest in the development of new methods to aid practicing professionals in voluntarily testing themselves against professional competency standards as a way of identifying areas of learning and improvement" (p. 111). This focus on the professional's role in his/her own continuing education activities (as opposed to the role of professional schools and employers) is unique and makes this article well worth reading; it suggests yet another use for competencies in the library/information profession.

Carter, Jane Robbins. "State Librarianship: Challenging the Enigma through Library Education." Journal of Education for Librarianship 20(4): 261-273 (Spring 1980).

Carter treats the neglect of state librarianship as a curriculum component in graduate library schools and the reasons for this neglect. The article lists competencies necessary for state library personnel (p. 267) that are derived from the 1976 "Institute for the Education of Prospective State Library Agency Professional Personnel." It mentions modular curriculum on state librarianship containing objectives available from author. Although the competencies are specified in ways that do not appear to be readily quantitatively measurable, this article is one of the few in its area that is recent and is important with regard to increasing LSCA Title III funds for interlibrary cooperation.

Casey, Genvieve M. "Education for Institutional Library Service." Library Trends 26(3): 431-445 (Winter 1978).

This article presents a generalized overview of education for institutional library service in all its forms. While the author does not specifically discuss curriculum, continuing education, or competencies for institutional library service, she does point out that the library/information professional must be prepared to deal with mainstreaming of those previously institutionalized, and that public librarians will have to learn from institutional librarians how best to serve these patrons' needs. She also stresses the need for specific kinds of interpersonal skills and background in appropriate cognate fields (psychology, law, medicine, social work, etc.) for the best provision of institutional library services.

Conant, Ralph W. The Conant Report: A Study of the Education of Librarians. Cambridge, Massachusetts: The MIT Press, 1980.

This controversial monograph reports the results of a survey of 16 graduate library schools and one undergraduate program. The research, sponsored by ALA with a grant from H.W. Wilson, was conducted during the early-to-mid 1970's. Data were collected by means of interviews with university officials, faculty, students, alumni, and library officers within a variety of types of libraries during site visits. One chapter each is devoted to faculty views, student views, alumni views and employer views of library education. The final chapter of this work is devoted to recommendations for reform in library education. Although one might question the time lag between the research and its publication, many of the issues cited as topics for reform are still with us today.

In spite of these serious drawbacks in this study (see annotation: Ramer, James D. et al. "The Conant Report: Three Deans Speak Out." Journal of Education for Librarianship 22(1-2): 89-99 (Summer-Fall 1981), The Conant Report is one of a few recent studies of library education as a whole based on actual data gathered and should not be regarded as lacking in value. Both its strong points and its weak points are important sources of information in that they serve to point out topics to be addressed and pitfalls to be avoided in similar research.

Cook, Michael. "Professional Training of Archivists: Problems of Modernization and Harmonization." UNESCO Journal of Information Science, Librarianship and Archives Administration 2(3): 150-158 (July-September 1980).

This article discusses international problems and issues in archival training and manpower as put forth at a UNESCO conference in 1979. While this article does not treat "core" competencies, the author's look into future needs may be somewhat useful due to certain tangential points raised. The need to educate/train professionals in problem solving methodologies is raised as is the deficiency in preparing conservation staff worldwide for future years. Also, a possible list of topics for inclusion in a core curriculum for the future is introduced.

Education of School Media Specialists. Master of Library Science Certificate of Eligibility for Permanent Certification. Jamaica, N.Y.: St. John's University, 1978.

This document examines the education of school media specialists at the Master's degree level for permanent certificaton. The discussion of competencies, assessment and program evaluation are quite useful in that an iterative process with feedback and modification has been set up. Core competencies for school media specialists are identified and tied to core courses. The hierarchically arranged competencies are also keyed to criterion behaviors and assessment modes. As is frequently the case, the competencies themselves are not quantitatively measurable, but the criterion behaviors presented are quite specific, and may serve as starting points for rewording the competency statements to make them more appropriate for use in the library/information profession. Learning modules are included.

Garrison, Guy. "Needed: A Core Curriculum for a Diversifying Profession." Journal of Education for Librarianship 19(2): 179-183 (Fall 1978).

Garrison's paper is a good, still relevant library education "issue paper" that is forward looking. While not as specific as it could have been, this essay is still quite substantive. Although it discusses the need for an integrated core curriculum and other issues, it does not address likely courses/skills/ topics for the integrated core curriculum.

Gorman, Michael. "The New 'Teaching Library'." American Libraries 12(11): 670-671 (December 1981).

In this short but substantive article, Gorman discusses the need for more practical education in technical services. He suggests the use of "teaching libraries" — major academic libraries in close proximity to library schools and the use of practitioners as educators as a means for students to acquire technical services skills in actual work settings. He does not go beyond the level of suggestion by investigating the plausibility of his idea and the willingness of technical services librarians (and university libraries as a whole) to become involved. Still, Gorman's notion of the "teaching library" has broad possibilities for many topics within library education (reference, acquisitions, collection development, automation, management, to name but a few) and deserves further investigation.

Hogan, Sharon Anne. "Training and Education of Library Instruction Librarians." Library Trends 29(1): 105-26 (Summer 1980).

Hogan's article points out practitioners' need for education in how to provide bibliographic instruction to library patrons. She discusses the various drawbacks of addressing this topic primarily by means of continuing education and also mentions its lack of widespread inclusion as a separate course in graduate library school curricula. The article calls for recognition of bibliographic instruction as a necessary topic for inclusion in library education, although it does not recommend specific topics within bibliographic instruction for inclusion into formal library education nor specific skills that bibliographic instruction librarians should possess.

Kashyap, M.M. "Curriculum Development and Design Process: A Systems Approach." International Library Review. 11(3): 353-365 (July 1979).

This article relates the systems approach to curriculum development and design in library/information science education. The author looks at curriculum in terms of its parts and defines it within this context ". . . as a system of planned action of instructions and evaluation methods for transmitting organized bodies of knowledge (subjects) to the learner, with the objective of increasing his knowledge and developing his intellectual ability, social behavior and vocational aptitude" (p. 356). Kashyap then breaks curriculum development down into its tasks, noting that it is an iterative group procedure where modification of a part necessitates re-examination of the whole. He also discusses various approaches to the selection and organization of curriculum contents, including the use of learning sets and learning modules in order to facilitate the achievement of educational objectives. Highly recommended reading.

Kingsbury, Mary E. "Educating Young Adult Librarians: Priorities of Practitioners and Educators." Drexel Library Quarterly 14(1): 4-18 (January 1978).

This study, because it does not identify tasks or competencies, is not directly relevant. However, within the four areas investigated (materials selection, programming and promotion, adolescent problems, and administration), it does reveal interesting differences in priorities among educators and practitioners and contributes to reaching a consensus of priorities in training young adult librarians. Overall, educators should give less time to materials selection and more time to adolescent problems and programming activities. How the areas for investigation were chosen is not discussed, nor are reference skills, library instruction, and the organization of materials included in the topics to be rated.

Larsgaard, Mary Lynette. "Education for Map Librarianship." Library Trends 29(3): 499-511 (Winter 1981).

This author presents a current view of the professional education needed by map librarians. Although specific competencies are not discussed, specific recommendations for inclusion in library science education are, which makes article valuable for attempting to translate curricula into highly-specific competencies needed for map librarianship. The author mentions the need for advanced cataloging, managerial skills, computer programming abilities, and foreign language reading abilities in addition to pointing out that since there are few jobs for map librarians, students must also be well-versed in general library skills so that they are not locked into a specialty with little prospect of employment.

Lemke, Antje B. "Alternative Specialties in Library Education." Journal of Education for Librarianship 18(4): 285-294 (Spring 1978).

As a whole this article, although well written, badly needs updating because it presents data gathered by means of a review of the bulletins of ALA-accredited schools from 1962 to 1977, supplemented by October 1977 data gathered by means of a questionnaire mailed to the same schools. While it brings up issues relevant to specialization within library/information schools, it does not (perhaps it was not foreseeable as a potential problem) treat the notion of integration of these specialty courses into the curriculum. Such an investigation is outside the scope of this review of offerings in "alternative specialties" as of October 1977 at schools with ALA-accredited programs.

Marco, Guy A. "An International Structure for Library Education." International Library Review 13(4): 357-363 (October 1981).

Based on a series of presentations by the author and Harold Lancour in 1977, this article describes a proposed international structure for library education which would establish a base for the effective planning and coordination of worldwide activities relating to library/information professionals. It mentions internationally-transferrable certification or its equivalent and the use of educational objectives and the task-oriented approach. Marco's article represents a generalized investigation of the subject.

Matthews, Elizabeth W. "Update in Education for Community College Library Administrators." Journal of Education for Librarianship 19(4): 304-311 (Spring 1979).

Matthews presents a summary of the results of a survey of the educational preparation of chief administrators of learning resource centers in public two-year community colleges. The respondents felt that they lacked adequate preparation in audiovisual subjects and expressed the need for educational background in curriculum (the author does not define this concept), learning theory, and management and administration as well as in the junior college as an institution. The respondents, most of whom had library science backgrounds, thought their library "core" courses were relevant to their current duties. The article as a whole is topical — it fails to mention (or investigate?) whether the respondents felt that the needed curricula should be offered by way of continuing education or in formal library school education and how these needed topics should be integrated into curricula (program, separate course, integrated within an existing course, etc.).

Minder, Thomas and Benjamin Whitten, Jr. "Basic Undergraduate Education for Librarianship and Information Science." Journals of Education for Librarianship 15(4): 258-269 (Spring 1975).

This article treats the development of an undergraduate program in the "information discipline", its component parts and its application in a model curriculum in Turkey. Published in 1975, it does not specifically address the notion of Bachelor's degrees in the "information discipline" as an end in their own right and for what level and for what kind of work such degrees would prepare students. Rather, the authors put forth the notion that a general undergraduate liberal education as a necessary precursor to graduate study in library/information science may no longer be appropriate. They then proceed to discuss the idea of an undergraduate curriculum based on the theory of the "information discipline" as a preliminary to graduate work.

Neal, James G. "Continuing Education: Attitudes and Experiences of the Academic Librarian." College and Research Libraries 41(2): 128-133 (March 1980).

This article reports the results of a study investigating continuing education for academic librarians. A stratified random sample of the librarians of the City University of New York were surveyed. The results discussed cover such areas as attitudes and continuing education activities, their interrelationships, and areas of perceived need for continuing education. Respondents preferred meetings, conferences and self-directed study to formal coursework. Recent graduates and younger librarians assigned a higher priority to continuing education for subject specialization than for continuing education for librarianship. "Automation, non-book materials, systems design and analysis, and data base operations were the areas identified most frequently and forcefully as requiring greatest attention in continuing education" (p. 132). Although Neal does not discuss competencies or specific continuing education activities, this article is unusual and indirectly helpful because it does point out specific areas in which continuing education was desired and the preferred format for these continuing education activities, which can in turn help in formulating competencies and aid the profession in developing educational activities which teach the needed competencies.

Neelameghan, A. Guidelines for Formulating Policy on Education, Training and Development of Library and Information Personnel. Paris: UNESCO, 1978.

This UNISIST report, while not directly relevant to our study, does provide a relatively good discussion of issues in planning library/information science educational policy as viewed within a generalized, international framework. The author relates education and training for library and information personnel to manpower needs within the pertinent social context(s).

Parr, Ed and Michael Done. "Curriculum Development and the Nominal Group Technique: Gaining The Practitioners' View." Journal of Education for Librarianship 19(3): 223-232 (Winter 1979).

This article, when compared to others about curriculum development as it relates to the library/information profession, is quite unique. The authors used the nominal group technique (NGT) to examine practitioners' views on which areas they felt were especially important for curriculum development at the Department of Library Studies, Western Australian Institute of Technology in Perth during June 1977 at which they are faculty members. The authors' application of NGT as strategy for arriving at a consensus in a group encounter is quite unusual and may possibly bear repetition in this country given a larger sized sample, perhaps even at professional association conference or institute. However, as a whole this essay is not directly relevant because the library/information education situation is quite different in Australia from that in the U.S. Still, Parr and Done's approach is quite stimulating and might possibly have relevant implications for curriculum development in this country.

Ramer, James D. et al. "The Conant Report: Three Deans Speak Out." Journal of Education for Librarianship 22(1-2): 89-99 (Summer-Fall 1981).

A strongly negative series of comments on The Conant Report, this article points out discrepancies between the proposal and the research report and inadequacies in planning and research methods used. Sampling and interviewing techniques were especially criticized, and the possibility that the researchers had predetermined the outcome of the study was mentioned. The authors all voiced significant dissatisfaction with the way in which the Conant study was conducted, expressing their doubts about the applicability of its results to library education at the Master's degree level in the U.S. as a whole, rather than just to the specific schools visited. Highly recommended.

Rider, Lillian M. Training Program for Reference Desk Staff. Second edition. Montreal: McGill University, McLennan Library, 1979.

This short booklet is McLennan Library's (McGill University, Montreal) training manual for reference desk staff. As this manual is not reference-task oriented in a way that is easily generalized to other academic libraries (the checklist provided refers to specific training as outlined in the manual, rather than to reference tasks or competencies), and because it is outdated in that it does not mention online searching, this manual is not directly relevant. However, it is the only example thus far encountered of library personnel educational materials produced by an employer for use in an actual work setting.

Saracevic, Tefko. "An Essay on the Past and Future(?) of Information Science Education — II." Information Processing & Management 15(16): 291-301 (1979).

This is the second part of an article looking at information science education and one of few that both treats information science education in general and is current. For these reasons it provides quite a good background to some of the problems in information science education. Saracevic also raises the issue of the ever-increasing cost of ". . . education in technological applications related to information science." However, in his discussion of graduate vs. undergraduate information science education, he neglects to relate degree level to current and future job market situations.

Saunders, W.L. Guidelines for Curriculum Development in Information Studies. Paris: UNESCO, 1978.

These guidelines were prepared under contract for UNESCO by W.L. Saunders in 1978 with international use in mind and are still timely. Only parts V (Levels of Programme), VI (Curriculum Content) and VII (Course Components) were reviewed. While this book does not specifically discuss competencies, the section on Course Components and especially pp. 31-33 (modules and their content) may be useful when determining how specific competencies best fit into overall library/information science curricula and then into specific courses.

Sheldon, Brooke E., ed. Planning for Evaluating Library Training Programs: A Guide for Library Leaders Staffs and Advisor Groups. Prepared by the Leadership Training Institute, School of Library Science, Florida State University, 1973. CLENE Concept Paper #3. Washington, D.C.: CLENE, 1976.

This document does not directly address competencies, task analysis or library/ information science education. However, this paper does set planning for evaluation of library/information science training squarely into a management context, while taking into account research in evaluation of educational programs both in a qualitative and quantitative sense.

Stone, Elizabeth W. "Educating Librarians and Information Scientists to Provide Information Services to Disabled Individuals." Drexel Library Quarterly 16(2): 10-31 (April 1980).

This article examines the barriers to library service (attitudinal, print, and architectural) to the disabled and relates the need to overcome these barriers to potential "remedial" solutions by means of recommending specific topics for inclusion in library science curricula. While the author does not actually put forth competencies needed in order to provide equal service to disabled library patrons, she does raise many points that have serious implications for the future of library/information science education and the profession. This article is especially worth reading in that it brings up interpersonal skills or "general attitudinal" qualities (competencies) that professionals must have in order to deal with patrons.

Taylor, Nettie B. "The Role of State Library Agencies in Continuing Education." Library Trends 27(2): 189-196 (Fall 1978).

This article discusses the role of the state library agency in continuing education. Some of the data presented badly need updating: the author makes clear the influence of the NCLIS report which led to the formation of CLENE and CLENE's later activities on state library agency continuing education programs, and the formation of multi-library type committees for planning continuing education under the aegis of the state agency. In general, this article was lacking in specifics about the particular continuing education programs set up by the state library agency and left the reader with more questions than answers.

Note: Our reviewers' questions were on such topics as the role of the state library agencies in continuing education with regard to the current uncertainties of CLENE's situation, and the current roles/status of multi-library type committees in view of increased LSCA Title 3 funds.

Taylor, Robert S. "Educational Breakaway." American Libraries 10(6): 364-368 (June 1979).

Taylor's article, though published in 1979, is still extremely relevant. The main thrust of what he has to say is summed up quite accurately by the heading below the article's title: "Our professional education must expand in scope to encompass an information career outside the library." The profession must break its identification with the traditional library and look to its abilities and skills as opposed to institutions. However, Taylor does not treat the ways in which library (and information science/studies/services) schools should change their curricula in response to the need to prepare students for information careers.

Townley, Charles and James Hollinger. Library Continuing Education in South Central Pennsylvania: The SPACE Council Needs Assessment. Middletown, Pennsylvania: Southcentral Pennsylvania Area Continuing Education Council, 1981.

This report is not directly relevant in terms of library/information profession competencies. However, it is useful in terms of finding out what problems potential students feel are important as topics for continuing library education and also what they see as barriers to participating in continuing library education. However, the number of respondents in the survey sample was really too low to be able to generalize about the results of study.

Wilson, Pauline. "ALA, the MLS, and Professional Employment: An Observer's Field Guide to the Issues." American Libraries 15(8): 563-566 (September 1984).

Wilson's article is a provocative "think-piece" written from an objective viewpoint. In it, she concisely treats a number of controversial topics: the MLS as a minimum requirement for professional employment, ALA involvement in the Merwine case, ALA goals, and whether librarianship is a profession. Wilson's comments on this last topic are especially worthy of our attention. Regardless of whether or not librarianship "...meets every characteristic associated with professions to the highest degree..." (p. 563) it ...is organized as a profession and **uses the methods** of a profession to achieve its professional goals" (emphasis in original, pp. 563-564). Thus, she dismisses the controversy over this point as a "non-issue". Her discussion of a profession's claim to a special relationship with society in terms of providing a quality service and taking responsibility for the quality of that service (p. 564) brings into a unified focus much of the controversy over ALA's goals. It is also one possible way of explaining why so much self-criticism abounds in the literature of our profession, especially of library education. The author, however, advises the profession against both careless self-criticism in the literature that can have a boomerang effect in the defense of librarianship, and against the adoption of impractical and costly objectives that defy achievement. Recommended reading.

Wilson, Pauline. "Impending Change in Library Education: Implications for Planning." Journal of Education for Librarianship. 18(3): 159-174 (Winter 1978).

Though published in 1978, much of this article is still current in 1982 in terms of certain conditions in library education that still have not been corrected. The author's recommendations for change are very specific and evidence a thorough consideration of the situation, despite the fact that they may appear to be impractical. She criticizes ALA in terms of its role in accreditation and quality assurance and suggests that ALISE take on a number of tasks relating to the closing of accredited library schools, faculty recruitment and Ph.D. production. However, some of her points are earlier discussions of today's major issues in much the same terminology. She discusses the need for knowledge in managerial skills and information handling and the need for more research in library/information science, positing a knowledge base approach for improvement in library/information science that incorporates relevant knowledge from cognate fields. The author brings together numerous issues in library/information science education in a very well articulated piece.

LIBRARY/INFORMATION COMPETENCIES

Abrera, Josefa B. and Jinnie Y. Davis. "Application of Programmed Instruction to Teaching of OCLC Data Base Searching." Journal of Education for Librarianship. 20(4): 235-250 (Spring 1980).

This article discusses the use of programmed instruction for teaching monographic searching on OCLC. The authors present some very valuable information in the text: a task analysis was completed to develop the programmed instruction text, developmental testing was conducted, their validation procedures (both preliminary and final) are discussed in detail (with particular mention of the use of validation to improve instruction), and clear, qualitatively measurable performance objectives are given.

Ahlers, Eleanor E. and Jean B. Wieman. School Library Media Supervisor Competencies: A Cyclic Design for Development. Seattle: Washington University, School of Librarianship, 1974.

This publication describes process by which 18 school library media supervisors from Washington, Oregon, Alaska and Hawaii met in an institute to systematically identify essential competencies for their profession and to interact with nine instructors of library media education in colleges and universities. Participants sought to produce a competency-based program and guide to the preparation and certification of library media supervisors, and to develop a variety of competency-based in-service/pre-service prototypes. Five major roles for a media supervisor were identified and competencies were defined for each role and for 28 functions.

Alberta Government Libraries Council, Job Specifications Committee. "Task Analysis Checklist for a Special Library." Special Libraries. 69(11): 443-46 (November 1978).

The authors present a list of tasks which might be performed in a special library, primarily designed to aid in the development of job descriptions. It is organized into three categories (library management, technical services and public services), but not otherwise broken down by suggested level of personnel.

Case, Robert N. Behavioral Requirements Analysis Checklist. Rev. ed. Chicago: American Library Association, 1973.

The Behaviorable Requirements Analysis Checklist (BRAC) is ". . . an identification of approximately 700 tasks to be performed by school library media specialists. Based upon the newly defined occupational definitions, the seven major areas of competencies and the behavioral objectives developed by the six programs of the School Library Manpower Project, BRAC represents a first attempt to anticipate, and in some instances to conceptualize, the functions and tasks of the school library media specialist to meet present demands and future needs of school library media users."

Chisholm, Margaret and Donald P. Ely. Media Personnel in Education: A Competency Approach. Englewood Cliffs, NJ: Prentice Hall, 1976.

A pioneering study in the development of a competency approach to the training of school media personnel. Chisholm and Ely present 62 competencies within 10 functional areas, and establish the basis for the development of media specialists with capabilities in several areas (e.g., management design, research and instruction) rather than limited specialization in one or two areas.

Daniel, Evelyn and Donald P. Ely. *Assessing the Competencies of Media Professionals: A Model for Determining Costs and Effectiveness*. Syracuse, NY: ERIC Clearinghouse on Information Resources, 1979.

Prepared for the National Institute of Education (DHEW), this report is essentially a summary/final version of *Competency-Based Assessment Project: Final Report*, (1979).

Daniel, Evelyn H. and Donald P. Ely. *A Process for Developing a Competency-Based Educational Program for Media Professionals*. Syracuse, NY: Syracuse University, 1977.

Documents the process by which a competency-based education program was developed for media professionals by Syracuse University in response to a mandate by the New York State Department of Education. A panel approach was used in (1) development of role models of media specialists; (2) identification and agreement upon competencies required to assume those roles; (3) development of an educational and administrative package to translate the competencies into a training program; and (4) specification of an organizational framework for program evaluation and modification. Includes an annotated bibliography, description of the school media specialist, criteria for admission into the Syracuse program, a course-by-competency matrix, and a list of competencies and methods for evaluating competency attainment.

Daniel, Evelyn H. *Competency-Based Assessment Project. Final Report*. Syracuse, NY: Syracuse University, September 30, 1979.

This report summarizes the procedures and outcomes of a study undertaken to provide educational decision makers with an array of cost-effective strategies for assessing the competencies of school library media specialists. It provides a literature review of the field and discussion of the classification and definition of assessment methods, measures of their effectiveness and efficiency, a cost effectiveness model, general competency assessment by faculty, dissemination of project results and research agenda. The appendix includes competencies, evaluation techniques and interview protocol for determining faculty assessment activities and assessment costs.

Galey, Minaruth and William F. Grady. *Guidelines for Certification of Media Specialists*. Washington, D.C.: Association for Educational Communications and Technology, 1977.

This document is AECT's most recently published version of guidelines for certification of media specialists. Although it is geared toward educational communication and technology (media) personnel as opposed to library personnel, this monograph is quite valuable in that it presents a list of tasks and competencies for media specialists and technicians. In general, not all competencies listed are relevant to library personnel, and most of those pertaining to media technicians are questionnable within the parameters of our study. However, this is one of the few relevant studies we are aware of which provides such a detailed framework for the development of competencies. Three major areas of responsibility (media management, media product development, instructional program development) are examined in terms of nine job functions (organization management; personnel management; research and theory, design, production, evaluation and selection, support and supply, utilization, and utilization/dissemination) for two levels of personnel (media specialist and media technician). This matrix might serve as a starting off point for the development of a model more suited to the library/information environment. As in much of the other literature, many of the competencies listed are not quantitatively measurable, but here they are unusually specific. Competencies within the support-supply function are incomplete, but a very well developed set of organizational management and personnel management competencies is provided. Also, certain functions/tasks and competencies relate directly to library/information professionals as researchers. Highly recommended reading.

Mahmoodi, Suzanne H. Identification of Competencies for Librarians Performing Public Services Functions in Public Libraries. Ph.D. thesis submitted to the Graduate School of the University of Minnesota, August 1978.

Mahmoodi's dissertation covers competencies for librarians performing public service functions in public libraries. The competencies presented are limited to professional level tasks performed by professionals. The author uses a goal analysis approach to identifying competencies as opposed to a task analysis approach, investigating both competencies needed for current practice and those needed for ideal practice by means of a survey of practitioners. The competencies identified and the literature review presented are useful in spite of the shortcomings noted below:

(1) The current and (ideal) competencies are somewhat dated in that the mean rank of online searching as a competency (#15) for current practice was equivalent to "of little importance" and its rank for ideal practice placed it at the very low end of the "of great importance" range.

(2) Surprisingly, no competencies were identified as essential in the aggregate for current practice, i.e., they were not unanimously rated as essential. The author did not examine the rank-ordered current competencies for statistically significant frequency breaks in order to arrive at a new scale which would rate certain current competencies as essential.

Medical Library Association. Certification Examination for Health Science Librarians. Chicago: Medical Library Association, 1981.

This booklet describes MLA's competency-based examination for entry level health sciences librarians. The exam attempts to test competence in job performance after a candidate has both received an MLS and has had two years of professional experience in a health sciences library after graduating. The booklet presents sample multiple choice questions geared to specific competencies. An appendix (p. 13-17) lists competencies to be tested arranged by library "operation" and then further broken down by subfunction. Within the context of the exam, the competencies are quantitatively measurable, but if used in other contexts, the competency statements would need modification in order to take into account appropriate behaviors that would demonstrate attainment.

Music Library Association. Committee on Professional Education. "Qualifications of a Music Librarian: A Statement." Fontes Artis Musicae XXI: 139-143 (1974).

Though this statement of competencies required by music librarians was prepared some ten years ago, its phrasing is sufficiently generalized and comprehensive to make it relevant to practice of music librarianship today. The authors discuss such functions as acquisitions, cataloging, reference, collection maintenance, and administration. They point out the need for a music librarian to have "basic musicianship" competencies: those relating to musical performance and identification of the characteristics of work of music. Knowledge of foreign languages and participation in professional society activities as evidence of career committment are deemed important.

Pfister, Fred C. Identification of Specialization Competencies for Florida School Media Specialists. Tampa: University of South Florida, 1980.

The author conducted a survey to determine which of 62 competencies for media specialists proposed by the Florida Department of Education Council on Education were regarded as essential. Five sub-groups including teachers, supervisors and principals responded to Pfister's attempt to validate the 62 competencies, of which 21 were designated as essential by all at the close of the survey. Survey results were compared with other similar studies and relevant literature, yielding a consensus that different groups had very different role expectations for media specialists and for the relative importance of many competencies. Essential competencies fell into three categories: teacher oriented, librarian oriented, and manager oriented. Surprisingly, competencies relating to research capabilities and instructional technology were regarded as non-essential by all respondents. Survey instruments as well as overall rankings and rankings by subgroup are provided. The competencies studied are formulated in terms of generalized statements rather than quantitatively measurable behavioral objectives. Highly recommended.

Pfister, Fred C. "Roles & Essential Competencies of Media Specialists." In: Media at the Center. 11th Annual Conference for Continuing Professional Development, April 16 and 17, 1982, pp. 47-52.

This article describes the author's use of competencies developed in another study (see annotation: Pfister, F.C. Identification of Specialization Competencies for Florida School Library Media Specialists. Tampa: University of South Florida, 1981) as an approach to job performance evaluation for school media competencies. Rather than discussing these specific competencies here, he treats the advantages and disadvantages of using essential competencies in the performance evaluation process. He addresses the use of competencies in specifying job duties and points out that competencies which are not considered essential may point towards areas where those who are deciding what is/is not essential may need to change their views of the field somewhat in order to draw closer to a consensus on competencies that experts and practitioners do view as essential. "A major conclusion of the study was that the competencies that were considered essential could be used as a valid base for planning, goal setting, and evaluation" (p. 50).

Putnam, William. Problems and Issues in Specifying Behavioral Instructional Objectives for Graduate Courses in Library Administration. Master's thesis submitted to the Department of Library Science of the Catholic University of America, October 1970.

Putnam's thesis, while not directly relevant to library/information competencies within our study, does provide a fairly detailed review of the theory of and literature on behavioral instructional objectives. The author's stated goal is to apply the theory of behavioral instructional objectives within a systems approach to the development of graduate courses in library administration; he presents an exploration of these applications, but actually fails to carry them out. Yet, Putnam's paper does bring out several relevant points: Mager's formal features of behavioral instructional objectives (student terminal behavior, conditions, and criteria) (p. 16), the necessity of matching the form of teaching strategies and evaluation to the form in which instructional objectives are stated by means of the terminal behavior(s) specified (pp. 20-21), and the kinds of learning that are most suited to professional-level graduate courses (from Gagne — concept learning, principle learning, and problem solving) (p. 32). This paper is quite thought provoking when one looks at competencies in terms of behavioral instructional objectives.

Ricking, Myrl and Robert E. Booth. Illinois Task Analysis Project, Phase III, Handbook. First Draft. Chicago: American Library Association, 1972.

This document reviews the background of the Illinois Task Analysis Project, including the original development of a task listing under the direction of Social and Educational Research and Development, Inc. (SERD) in Phase I, and the validation of those tasks for particular library fields in Phase II. It identifies the tasks and guidelines for utilizing both job analysis and task listings for job restructuring and description. Tasks are not limited to any library sub-field or level.

Swan, John C. "Minimum Qualifications and Intellectual Freedom." Library Journal. 105(15): 1595-99 (September 1, 1981).

This position paper treats the role of the librarian in light of the intellectual freedom controversy. The author advocates a more active role for librarians, one in which they should be prepared to act as interpreters of information if the patron so desires: "to offer informed, content-oriented guidance relating to the library materials sought by the patron" (p. 1597) without imposing their own views. Swan attempts to tie this role to minimum qualifications and job competencies, but only glosses over this aspect. As such, this article is only marginally relevant for our purposes, but it could be considered to have interesting implications for the changing and potential roles of library/information professionals:

e.g., community outreach specialists, institutional librarians, career guidance and employment information programs now surfacing in public libraries, etc.

CERTIFICATION

American Association of Law Libraries. "Application for Certification" (with related materials). Chicago: American Association of Law Libraries, n.d.

These materials discuss law librarian certification as administered by the American Association of Law Libraries. Like MLA certification, certification by AALL requires evidence of "subject competence" in addition to competence in librarianship. Certification is based upon a combination of education and experience, with one half of the experience required to be in a law library.

American Library Assocation, Library Administration and Management Association. Certification of Public Librarians in the United States. 3rd Edition. Edited by Mary J. Coe. Chicago: ALA-LAMA, 1979.

Edited by Mary Jo Coe, this booklet represents the most current compendium of certification requirements for public librarians in the United States. Published in 1979, it contains brief descriptive information based upon that provided by the appropriate state agencies. Arranged by state and then within each state by level of certification and/or type of position, clear, concise data are given. However, unlike Woellner's book, this work is not updated annually and the data for some states are no longer correct. Still, it represents the only source of information on certification requirements for public librarians (other than each individual state agency) of which we are aware.

Institute of Certified Records Managers. "Materials Pertaining to Certification of Records Managers." Washington, D.C.: ICRM, various dates.

Certification of records managers by the ICRM, as described in these materials, is based upon a combination of education and experience qualifications: a Bachelor's degree and three years of professional records management experience are required, although equivalency mechanisms whereby experience can be substituted for education have been established. The applicant must successfully attain these qualifications in addition to passing an examination covering records management written and administered by the ICRM. Materials received from the ICRM described both certification requirements in general and the examination.

National Libraries Association. A National Board of Certification for Librarians: A Draft Proposal (with appendix: Position Statement on Certification of the Professional in Library and Information Services). NLA, 1983.

This short draft proposal puts forth the notion of voluntary certification of librarians. Qualifications include five years professional experience, possession of an MLS degree, and one element of continuing education for each year of practice. Provision is made for advanced certification after possession of basic NLA certification for 10 years on the basis of progressively responsible professional practice and continuing educational activity. Justification for this proposed uniform system of certification is based upon providing standards for miniumum professional practice to evaluate the competence of those who practice, therefore ensuring that quality information services are provided.

Virgo, Julie A. "Degree or License." Wilson Library Bulletin 51: 341-345 (December 1976).

Virgo's article discusses the "credentialing" of librarians. She provides clear distinctions between the terms "accreditation," "certification," "licensure," and "registration" for the first time in the literature encountered thus far. Equivalency testing and proficiency testing are also defined and mentioned as means by which competent individuals possessing nontraditional education/training may gain acceptance into the profession of librarianship. The author also points out that accreditation and certification are complementary screening mechanisms and that certification of only those individuals who have graduated from accredited programs may be unnecessarily restrictive. While Virgo does raise this issue, information regarding a U.S. Office of Personnel Management equivalency test by which paraprofessions can enter the profession librarian series is no longer current. There is also no mention of the current question of "credentialing" non-library information professionals.

Woellner, Elizabeth H. Requirements for Certification for Elementary Schools, Secondary Schools, Junior Colleges. Teachers Counselors, Librarians, Administrators. Forty-eigth Edition, 1983-84. Chicago: University of Chicago Press, 1983.

Woellner's book is an annually updated digest of the requirements for certification of educational personnel (primarily within public institutions of elementary and secondary education) in the United States. Arranged by state and then within each state by kind of certification/ position type, a brief description of the requirements for certification (as abstracted from current literature gathered from the appropriate state or regional government body) for each position is furnished. Although the descriptions given for certification requirements of school librarians were often unclear and sometimes incomplete, Woellner's book, in its most current edition, is one of the most convenient and time-saving sources of information available on certification of school librarians in the United States.